DCC Mini System FW68/22B

Service
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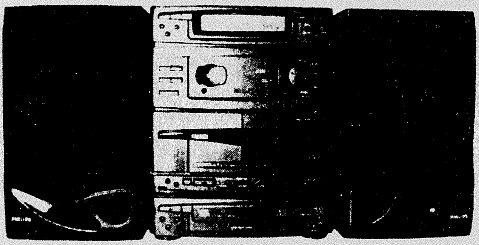

Service Manual

DIGITAL dcc COMPACT CASSETTE

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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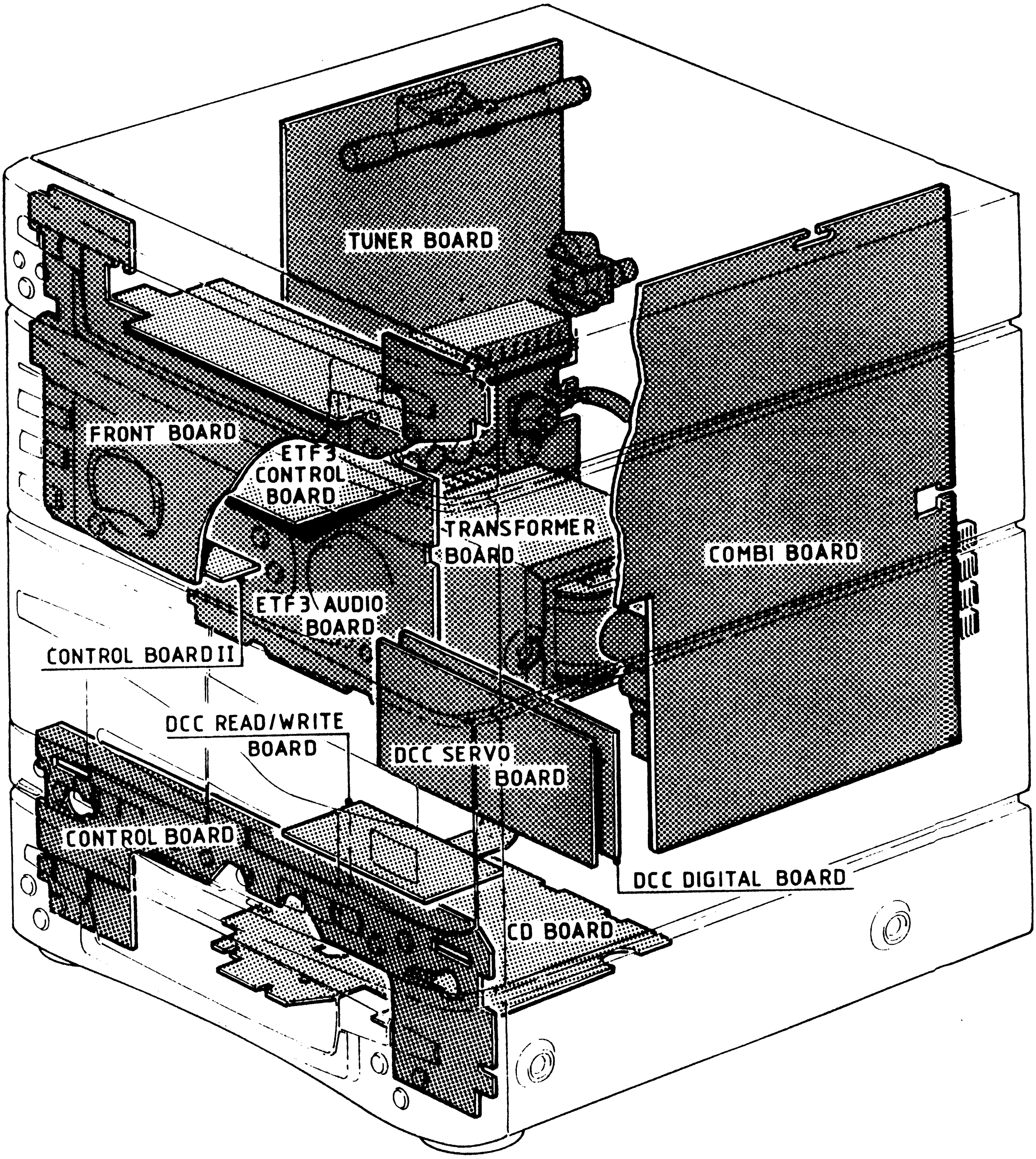
PHILIPS

LOCATION OF THE PRINTED CIRCUIT BOARDS


TUNER BOARD
FRONT BOARD
ETF3 CONTROL BOARD
TRANSFORMER BOARD
COMBI BOARD
ETF3 AUDIO BOARD
CONTROL BOARD II
DCC READ/WRITE BOARD
DCC SERVO BOARD
CONTROL BOARD
DCC DIGITAL BOARD
CD BOARD

Technical specification

General:

Mains voltage : 230V / 50Hz
Power consumption : ≤150W at maximum output power
: ≤10W in stand by

Amplifier:

Output power : 2 x 27W at 6Ω D=10%
Music power : 2 x 54W at 6Ω
Headphone : 3,5mm stereo jack 25mW at 32Ω

Power stage protection : Shortcircuit
Frequency response : 63 Hz - 15kHz (-3dB) Limit
: 63 Hz - 17kHz (-3dB) Typ. value

Input sensitivity
AUX/TV : 150mV
: 500mV
: 1500mV

Tuner:

FM
Tuning range : 87,5 - 108MHz
Grid : 50kHz
Aerial input : 75Ω Coax
IF : 10,7MHz ± 25kHz
Sensitivity Mono 26dB S/N : ≤ 1,7μV
Sensitivity Stereo 46dB S/N : ≤ 45μV
Sensitivity Search tuning : ≤ 7μV
Distortion at RF=1mV, Δf=75kHz : ≤ 7% (2% typ.)
Channel separation : ≥ 26dB (30dB typ.)
Immage rejection ratio : ≥ 30dB (70dB typ.)
3 dB limiting point : ≤ 2μV (1,5μV typ.)

MW
Tuning range : 522 - 1611kHz
Grid : 9kHz
Aerial input : Ferrite antenna
IF : 450kHz ± 1kHz
Sensitivity : ≤ 2mV/m
Distortion at RF=100mV, m=80% : ≤ 5% (3% typ.)
Immage rejection ratio : ≥ 27dB (30dB typ.)

LW
Tuning range : 153 - 279kHz
Grid : 3kHz
Aerial input : Ferrite antenna
IF : 450kHz ± 1kHz
Sensitivity : ≤ 5 mV/m
Distortion at RF=100mV, m=80% : ≤ 5% (3% typ.)
Immage rejection ratio : ≥ 40dB (43dB typ.)

CD unit:

Have to be measured direct on internal connector 1300

Frequency response : 20 - 20.000Hz ±2dB
Output level : 2V ±3dB
Signal/noise ratio : 90dB
Distortion : < 1% at 1kHz
Channel difference : < 2dB at 1kHz
Channel crosstalk : 50dB max.
De emphasis : 0 or 15/50 μs
Laser
Output power : ≤ 500μW
Wave length : 780nm ± 20nm

Analog Recorder part:

Tape speed : 4,76cm/s ±2%
Wow & Flutter : ≤ 0,4%
Winding speed : ≤ 130s for C60 cassette
Erase / Bias system : AC 90kHz ± 5kHz
RIF-shift : service solution on request
Distortion at 200 nWb/m : ≤ 5%
Channel difference at PB : ≤ 3dB
Channel difference overall : ≤ 3dB
Channel separation : ≥ 18dB at 1kHz
Track separation : ≥ 55dB at 1kHz
ALC attack time : ≤ 20ms
ALC recovery time : ≥ 60s

Frequency response : 100Hz - 12,5kHz within 5dB
Signal to Hiss ratio[1] : ≥ 48dB (52dB typ.)
Signal to Noise ratio[2] : ≥ 44dB (47dB typ.)
Erase attenuation[3] : ≥ 58dB

[1] at 250 nW/m A-weighted
[2] at 250 nW/m FF-weighted
[3] use a 1kHz passfilter to minimize the wide band noise component.

DCC Part:

ANALOG IN *(digital recording from analog input)*
Sampling frequency : 44,1kHz
Input sensitivity : 190mV
Input impedance : 2,2kΩ

ANALOG OUT *DCC PLAYBACK (DAC performance)*
Output voltage : 1,5Vrms ±2dB (0dB digital level)
Frequency range : 20Hz..14,5kHz at fs = 32kHz
: 20Hz..20kHz at fs = 44,1kHz
: 20Hz..22kHz at fs = 48kHz
Amplitude linearity : ± 0,5dB
Phase non-linearity : 2° max. at 1kHz
Outband attenuation : ≥ 60dB above 30kHz
Channel separation : ≥ 85dB at 1kHz
Muting (search) : ≥ 98dB
SNR : ≥ 87dB (>89dB A-weighted)

ANALOG OUT *DCC RECORD & PLAYBACK (ADC & DAC performance)*
Output voltage : 1,5Vrms ±0,5dB
Frequency range : 20Hz..20kHz at fs = 44,1kHz
Amplitude linearity : ± 1dB
Phase non-linearity : 2° max. at 1kHz
Outband attenuation : 60dB above 30kHz
Channel separation : 85dB at 1kHz
Muting (search) : ≥ 98dB
SNR : ≥ 87dB (>100dB A-weighted)

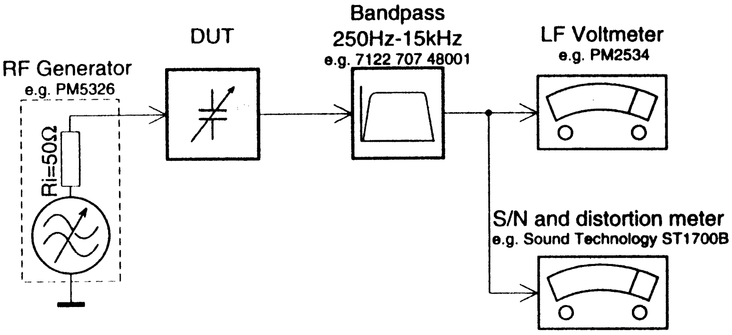
ANALOG OUT *ACC PLAYBACK*
Output voltage : 125Vrms ±6dB (200nWb/m)
Amplitude linearity : 40Hz..14kHz within 3dB
Channel separation : ≥ 20dB at 1kHz
SNR : ≥ 53dB (Ferro)
: ≥ 56dB (Crome)
THD : ≤ 1,5% at 1kHz/0dB

***Remote Control:* RC 5 Commands**

Amplifier Keys	System Code	Command Code	Tuner keys	System Code	Command Code
Standby	xx	12	Preset up	17	32
Source CD	20	63	Preset down	17	33
Source Tuner	17	63	Tuning up	17	30
Source DCC	23	63	Tuning down	17	31
Source Analog Cassette	18	44	News	16	90
Source AUX/TV	0	63	Sleep	16	38
DSC	16	79	Analog Deck keys	System Code	Command Code
Volume up	16	16	Stop	18	54
Volume down	16	17	Play	18	53
Numeric 10 keys	xx	0....9	Side	18	47
CD Player keys	System Code	Command Code	Wind	18	52
Play	20	53	Rewind	18	50
Pause	20	48	DCC keys	System Code	Command Code
Stop	20	54	Stop	23	54
Next	20	32	Play	23	53
Previous	20	33	Side	23	47
Forward search	20	52	Wind	23	52
Backward search	20	50	Rewind	23	50
			Next	23	32
			Previous	23	33

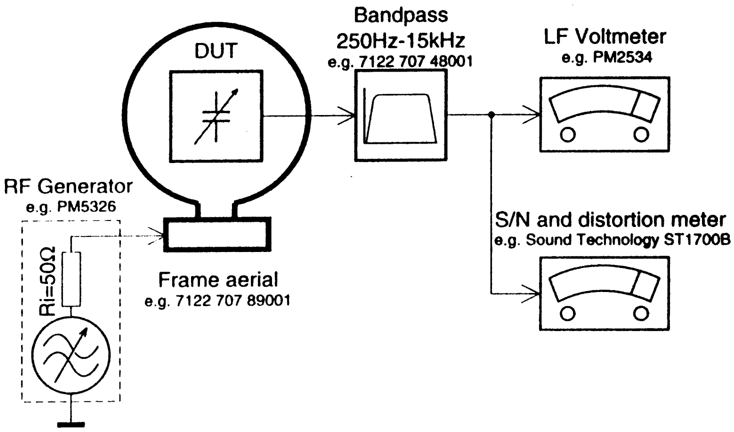
Measurement setup

Tuner FM


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

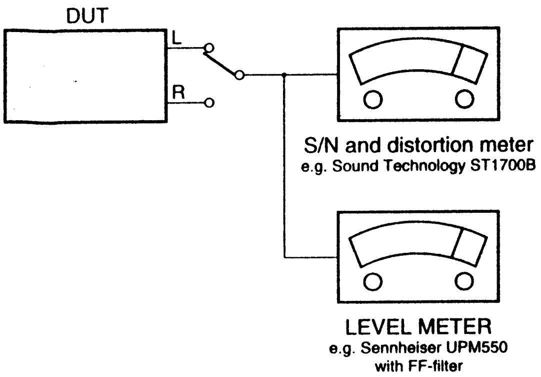
Tuner AM (MW,LW)


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B
Frame aerial
e.g. 7122 707 89001

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

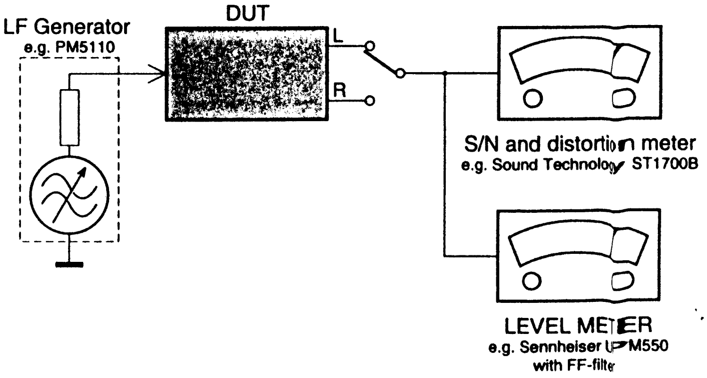
CD

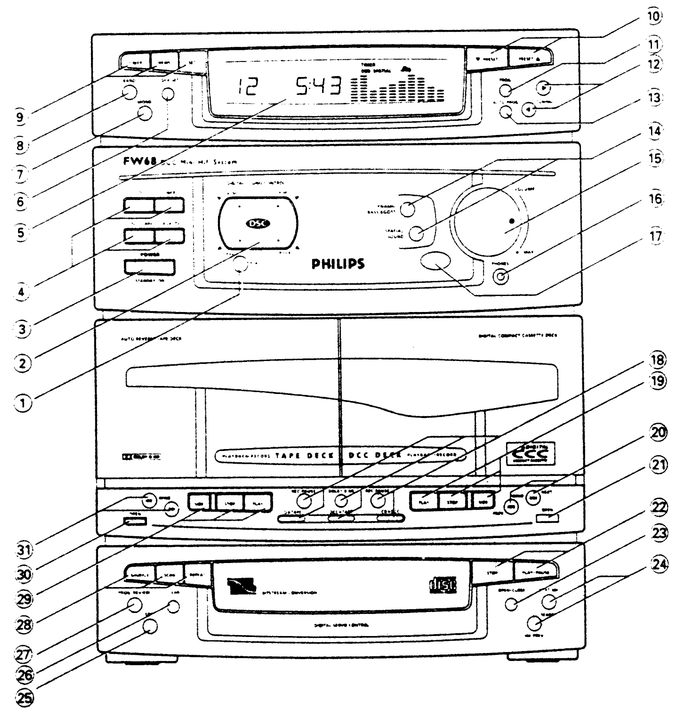
Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

RECORDER

Use Universal Test Cassette **CrO$_2$** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter



Amplifier and Tuner

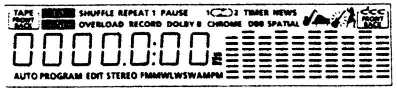
① **FLAT** ....to cancel the DSC mode

② **DIGITAL SOUND CONTROL** (DSC)
to select the desired sound setting:
CLASSIC, POP, JAZZ or ROCK

③ **POWER** ....to switch the set on and off

④ **Sound source selection buttons**:
CD ....to select the CD player
TUNER ....to select the tuner
DCC/TAPE ....to select the DCC or TAPE deck
AUX-TV ....to select the Aux-TV mode (for external sources, e.g. TV sound)

⑤ **Display**


TAPE
FRONT
BACK
SHUFFLE REPEAT 1 PAUSE
1 2
TIMER NEWS
OVERLOAD RECORD DOLBY B CHROME DBB SPATIAL
dcc
FRONT
BACK
AUTO PROGRAM EDIT STEREO FM MW LW SW AM PM

⑥ **CLOCK SET** ....to set the clock

⑦ **MONO** ....to switch to mono reception (FM only)

⑧ **BAND** ....waveband selection: FM, MW and LW

⑨ **TIMER** ....to activate/deactive the timer
NEWS ....to activate/deactive the news feature
SET ....to set the timer or news feature

⑩ **PRESET ▲▼** ....to select a radio preset station and for various settings in clock/timer/news mode

⑪ **PROG**...................to program preset stations manually

⑫ **TUNING ◀▶** ......to tune to radio stations and for various settings in clock/timer/news mode

⑬ **AUTO PROG** ....to program preset stations automatically

⑭ **DYNAMIC BASS BOOST** - to increase the bass level

SPATIAL SOUND to increase the stereo effect

⑮ **VOLUME** ....to adjust the volume level

⑯ **PHONES** socket ..for headphones with a 3.5 mm plug

Note: Inserting the plug will disconnect the speakers.

⑰ **IR SENSOR** ....remote control eye

Cassette decks (TAPE and DCC deck)

DCC and TAPE deck

18 **REC PAUSE** ....to prepare the TAPE deck for recording
DOLBY B NR ....to switch the Dolby Noise reduction system on and off
REC PAUSE ....to prepare the DCC deck for recording
CD ▸TAPE ....to record from a CD onto an ACC
DCC ▸TAPE ....to copy a tape from the DCC deck to the TAPE deck
CD▸DCC ....to record from a CD onto a DCC

DCC deck

⑲ **PLAY** ....to start playback or recording of a DCC or playback of an ACC
STOP ....to stop the tape
SIDE ....to select the front or back side of the tape
⑳ **WIND NEXT ▸▸|** ..to wind fast forward or to select the beginning of the next track
WIND PREV |◂◂ ..to rewind fast or to select the beginning of the current or a previous track
㉑ **OPEN**...................to open the cassette compartment

TAPE deck

㉙ **PLAY** ....to start playback or recording of an ACC
STOP ....to stop the tape
SIDE ....to select the front or back side of the tape
㉚ **OPEN** ....to open the cassette compartment
㉛ **WIND ▸▸** ....to wind fast forward
WIND ◂◂ ....to rewind fast

CD player

㉒ **PLAY-PAUSE** ......to start and interrupt CD play
STOP ....to stop CD play

㉓ **OPEN-CLOSE** ......to open and close the CD tray

㉔ **SEARCH NEXT ▸▸|**
to skip to the beginning of a subsequent track and to search forwards
SEARCH PREV |◂◂
to skip to the beginning of the current or a previous track and to search backwards

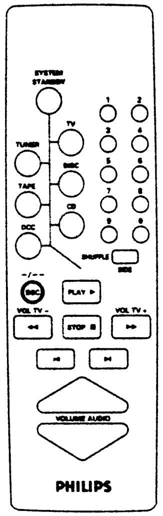
㉕ **EDIT** ....to select the recording time when making a recording

㉖ **CLEAR** ....to erase a program or one track out of the program

㉗ **PROG-REVIEW** ...to program tracks and review the program

㉘ **SHUFFLE** ....to play in random order
SCAN ....to play the beginning of each track
REPEAT ....to repeat one track or to repeat all tracks

Remote control functions



- Always first select the desired sound source and then press the respective button (for example CD, PLAY ▶ and ▶|).

SYSTEM STANDBY
to switch the set to standby
TUNER / TAPE / DCC / TV / CD
sound source selection buttons
DISC to select a CD in a CD changer (no function for this set)
0 - 9
-CD, DCC: to key in a track number
-TUNER: to key in a preset number
-TV: to key in a TV station
(numbers consisting of two figures must be keyed in within 2 seconds)
SHUFFLE / SIDE
-CD: to activate the shuffle feature
-TAPE, DCC: to select the front or back side of the tape
DSC - to select the desired sound setting:
CLASSIC, POP, JAZZ, ROCK or FLAT
PLAY ▶
- CD, TAPE, DCC, VCR: to start play
STOP ■
- CD, TAPE, DCC, VCR: to stop play
◀◀ ▶▶ / VOL TV
-TUNER: to tune to radio stations
-TV: to adjust the volume
-CD: to search a particular passage
-TAPE, DCC: to wind the tape
|◀ ▶|
-TUNER: to select a radio preset station
-TV: to select a TV preset station
-CD, DCC, TAPE: to select the beginning of the current/previous or a subsequent track
VOLUME AUDIO
to adjust the volume level of the set

Notes:

- The remote control remains tuned to the selected sound source until another sound source button on the remote control is pressed.

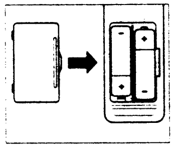
- TV or VCR can only be selected if the unit uses the RC-5 remote control system.

- If TV is selected on the remote control, the SYSTEM STANDBY button will first switch the TV to standby and after 1 sec the whole set.

Installation

- ***For users in the U.K.:*** please follow the instructions on page 2.
- After unpacking the system, remove all protective material. All redundant packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials
  - cardboard (box)
  - expandable polystyrene (buffer)
  - polyethylene (bags, protective foam sheet)
- Do not cover the vents and make sure that you leave sufficient room around the unit for ventilation.

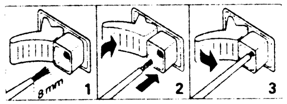
Remote Control:



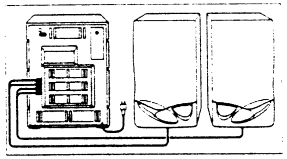
- Open the battery compartment and insert the batteries supplied (type R03, UM-4 or AAA) as indicated.
- Remove the batteries if exhausted or if they will not be used again for a long period.

Note: Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packing materials, exhausted batteries and old equipment.

Speaker connections



One of the two wires of a loudspeaker cable is marked, e.g. with a colour or rib.

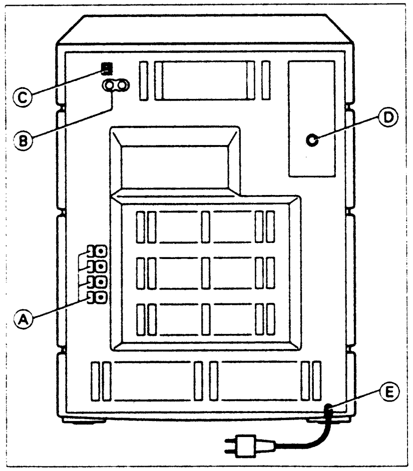


1 The marked wire should be connected to the red terminal and the unmarked one to the black terminal.

2 Make sure that the colour combination of wire and terminal is the same for each loudspeaker.

- The position of the loudspeakers should be carefully selected to achieve the best possible stereo effect. As every room has different characteristics, the best position can be found by experimenting. The bass frequencies will be emphasised if you place the loudspeakers on the floor or in a corner. Treble response will be weakened if you place the loudspeakers behind furniture or curtains.

Back panel



Ⓐ **SPEAKERS** ....Terminals for two loudspeakers, impedance of original speakers 6 ohms
If other speakers are used, they should have an impedance of at least 6 Ohm.

Ⓑ **AUX/TV IN**..........Sockets for a connection of other sound sources (e.g. record player with a ceramic pick-up or a built-in preamplifier, TV set, VCR, etc.).

Ⓒ **INPUT SENSITIVITY** ....Switch for adjusting the input level for the AUX/TV IN socket (see also 'General information on recording')

Ⓓ **FM AERIAL**..........Socket for FM antenna, 75 ohms
The antenna wire supplied with the unit can be connected to this terminal. Adjust the position of the FM antenna for optimum reception.
For good FM stereo reception, use an FM outdoor antenna or connection to your house distribution system.

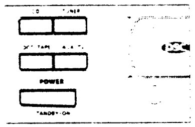
Ⓔ **MAINS**................Mains lead

Notes:

- Check that the local mains voltage corresponds to the voltage indicated on the type plate before connecting the system to the mains. If this is not the case, consult your dealer. The type plate is located at the rear of the system.

*- When you first plug the unit into the mains, 0:00 will flash on the display **until you set the clock**.*

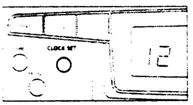
Switching on and off/standby



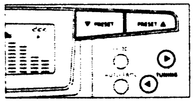
- To switch on the unit, press any sound source button (CD, TUNER, TAPE/DCC or AUX/TV) or POWER STANDBY ON.
- To switch off the unit, press POWER STANDBY ON on the amplifier (or SYSTEM STANDBY on the remote control).
  → The unit is in standby mode, the display shows the clock. The standby indicator in the volume knob (red light) remains **on**.
- To switch off the power supply, remove the mains plug from the wall socket.

Note: The clock memory will be maintained for only ten minutes after the power supply is switched off.

Setting the clock



1 In standby mode press CLOCK SET.
→ The set is in clock setting mode and the hour digits on the display start flashing.



2 Press PRESET ▲ or ▼ until the correct hour appears on the display.

3 Press TUNING ◀ or ▶ to switch to the minutes setting.
→ The minute digits on the display start flashing.

4 Now, press PRESET ▲ or ▼ until the correct minutes appear on the display.

5 Press CLOCK SET again to leave the time setting mode.
→ The seconds are set to zero and the clock starts running.
→ The display shows the adjusted time.

Notes:

- When you hold down PRESET ▲ or ▼ for more than 3 sec, the digits on the display will change automatically (within the 24-hour mode) until you release the button.

- If no button is pressed for more than 90 seconds, the clock setting mode is left automatically without storing the last changes.

Selecting sound sources

- Select the desired sound source by pressing the respective sound source button – CD, TUNER, TAPE/DCC or AUX/TV (or TUNER, TAPE DCC, TV or CD on the remote control).
  → The display indicates the selected sound source.

Automatic sound source selection

Some buttons on the unit will make the system switch automatically to the related source.

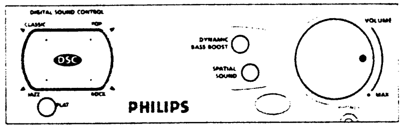
- The automatic **TUNER-related** buttons are: ▲ PRESET ▼, ◀ TUNING ▶ (except in the clock/timer/new setting mode), BAND.

- The automatic **CD-related** buttons are: PLAY·PAUSE, SCAN and SHUFFLE when a CD is inserted in the tray and OPEN/CLOSE.

- The automatic **TAPE DECK-related** buttons are: PLAY, ◀◀ WIND ▶▶, DCC ▶TAPE, CD ▶TAPE.

- The automatic **DCC DECK-related** buttons are: PLAY, SEARCH PREV ⏮, SEARCH NEXT ⏭, CD ▶DCC.

Adjusting volume and sound



- Adjust the volume with the VOLUME control on the amplifier (or VOLUME AUDIO on the remote control).
- Press SPATIAL SOUND to create a wider stereo effect.
- Press DYNAMIC BASS BOOST to boost the bass response.

Digital Sound Control (DSC)

The DSC feature creates a realistic atmosphere for the style of music you select, using the latest digital sound technology. The unit offers the following DSC modes:

CLASSIC - for the dramatic depth of classical music in an auditorium
POP - for the electric excitement of stadium pop
ROCK - for the subtle extension of the music's dimensions
JAZZ - for that brassy bite of jazz at close quarters

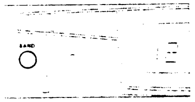
1 Press CLASSIC, POP, JAZZ or ROCK on the amplifier (or DSC on the remote control) to enhance the type of music you are listening to.
→ The display indicates the selected sound setting.

2 Press FLAT on the amplifier (or DSC on the remote control) to cancel the DSC mode.

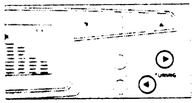
TUNER

Tuning to radio stations

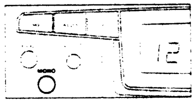
1 Press TUNER on the amplifier or on the remote control.
→ First TUNER appears on the display and after a few seconds it will show the frequency.



2 Select the desired waveband by repeatedly pressing BAND.
→ The display indicates in turn: FM–MW–LW–FM–...



3 Press TUNING ◀ or ▶ for approx. two seconds and then release the button (or ◀◀ or ▶▶ on the remote control).
→ The digits on the display change according to the frequency and stop when a station with sufficient strength has been found.

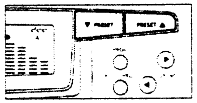


4 Press MONO to switch over to mono reception if there is interference noise caused by poor FM stereo reception.

5 Repeat this procedure until you find the desired station.

Note: If you briefly press TUNING ◀ or ▶ (◀◀ or ▶▶ on the remote control), *the frequency changes step by step.*

Tuning to preset stations



- Press PRESET ▲ or ▼ until the desired preset number appears on the display (on the remote control use the buttons ⏮ or ⏭ or 0-9).
→ The memory allocation number (1-30) appears next to the frequency on the display.

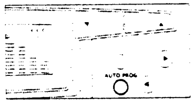
Programming radio stations (preset stations)

You can preset thirty stations in the memory.

Automatic programming

1 Press TUNER on the amplifier or on the remote control.

2 Press PRESET ▲ or ▼ until preset number 1 appears on the display (on the remote control use the buttons ⏮ or ⏭ or 0-9).



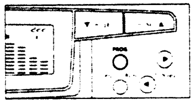
3 Press AUTO PROG for approx. two seconds and then release the button.
→ The tuner automatically tunes to FM stations.
Up to 30 stations of sufficient strength will be stored in the memory. If less than 30 FM-stations of sufficient strength are found, the tuner will also scan through MW and LW.
→ During programming, AUTO PROGRAM flashes on the display.
→ The first newly stored preset number is automatically tuned in.

- To stop the automatic programming, press AUTO PROG.

Note: You can prevent preset stations already stored from being overwritten by tuning to the next higher memory allocation number.
***Example:** You want to keep preset stations no. 1 to 5.*
In this case, press PRESET ▲ or ▼ until the allocation number 6 is displayed. If you now press AUTO PROG, only the preset numbers 6 to 30 will be overwritten.

Manual programming

1 Press TUNER on the amplifier or on the remote control.



2 Press PROG on the unit.
→ During programming, PROGRAM flashes on the display.

3 Tune to the station to be programmed with TUNING ◀ or ▶ (or ◀◀ or ▶▶ on the remote control), as described earlier.

4 If desired, switch over to mono reception by pressing MONO.

5 Press PRESET ▲ or ▼ to allocate a number from 1 to 30 to the preset station (on the remote control use the buttons ⏮ or ⏭ or 0-9).

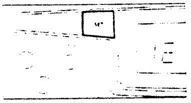
6 Press PROG to confirm the setting.
→ The frequency, preset number and stereo setting are now entered in the memory.

TIMER and NEWS FEATURE

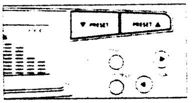
Setting the TIMER or the NEWS feature

- TIMER: You can wake up to the desired sound source at a preset time.

- NEWS: You can receive the news at a preset hourly time by programming the minutes for the starting and stopping time.



1 For **TIMER** and **NEWS** setting:
Press SET to enter the timer setting mode.
→ TIMER appears and the Timer flag starts flashing.



2 For **NEWS** setting only: Press PRESET ▲ or ▼ to switch from the timer to the news setting mode.
→ NEWS appears and the News flag starts flashing.

3 For **TIMER** and **NEWS** setting:
Press SET to confirm your selection.
→ If you have selected **NEWS**, the set switches to TUNER mode and the display shows the tuned-in preset number and its frequency.
→ If you have selected **TIMER**, the display indicates TUNER.

4 For **TIMER** setting only:
To select the sound source, press PRESET ▲ or ▼.
→ The display indicates the selected sound source in turn: TUNER–CD–DCC–ACC–BUZZER–DCC REC (record)–ACC REC (record)–TUNER–...

To confirm the source selection, press SET.

5 For **NEWS** and for **TIMER** setting when **TUNER** is selected:
Press PRESET ▲ or ▼ until the desired preset station appears on the display.

To confirm the preset station, press SET.
→ For News only: The display shows START and then the minute digits for the starting time start flashing.

6 For **TIMER** setting only:
Adjust the volume and confirm the setting by pressing SET.
→ The display shows START and then the hour digits for the starting time start flashing.

7 For **TIMER** setting only:
To set the starting time, use PRESET ▲ or ▼ and TUNING ◀ or ▶ as described in the chapter SETTING THE CLOCK.

8 For **NEWS** setting only:
Press PRESET ▲ or ▼ to set the starting time at which the news will be broadcast.
→ The display shows the selected minutes.
Example: select 30 if the news is broadcast at xx:30.

To confirm the starting time, press SET.
→ The display shows STOP and then the minute digits for the stopping time start flashing.

Now, press PRESET ▲ or ▼ to set the stopping time.
→ The display shows the selected minutes.
Example: select 35 if the news broadcasting finishes at xx:35.

9 For **TIMER** and **NEWS** setting:
Press SET to store the starting (and stopping) time and to leave the timer or news setting mode.
→ On the display the Timer or News flag stops flashing.
The timer or news feature is activated.

Note: If no button is pressed for more than 90 seconds during timer or news setting, the setting mode is left automatically without storing the last changes.

At the preset starting time ...

→ The power is turned on or, if another sound source is selected, the set switches to the preset source.
The preset sound comes on automatically.

→ TIMER: If the set was activated from standby mode and no button is pressed for more than 1 hour, the power is turned off again.
NEWS: At the preset stopping time, the set will return to its previous state.

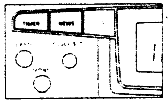
→ The Timer or News flag disappears from the display.
The alarm is deactivated.

Notes:
- If there is the same starting time for timer and news, the news feature will be activated.

- If you are recording at the time the alarm is activated, the alarm function will be cancelled.

- After 1 minute the BUZZER alarm will stop and the unit will return to its previous state.

Reactivating/deactivating the timer or news feature

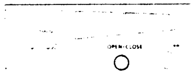


- Press TIMER or NEWS.
→ **On:** The Timer or News flag appears on the display and the starting time is shown briefly.
→ **Off:** The Timer or News flag disappears from the display.

Playing a CD

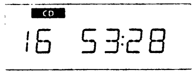
1 Press CD on the amplifier or on the remote control.
→ If there is no CD in the CD tray, the display will show NO DISC.

2 Press OPEN·CLOSE on the CD player to open the CD tray.
→ The display shows OPEN.

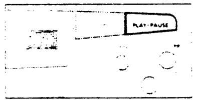


3 Insert an audio CD, printed side up.

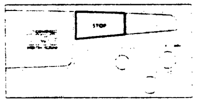
4 Close the tray by pressing OPEN·CLOSE.
→ The total number of tracks and the total playing time appear on the display.



5 Press PLAY·PAUSE on the CD player (or PLAY ▶ on the remote control) to start play of the entire CD.
→ The current track and the elapsed time of the current track appear on the display.



6 To stop CD play, press STOP on the CD player (or STOP ■ on the remote control)
→ The total number of tracks and the total playing time appear on the display.



- You can interrupt CD play by pressing PLAY·PAUSE on the CD player. Continue CD play by pressing PLAY·PAUSE again (or PLAY ▶ on the remote control).
→ During the interruption, the display indicates PAUSE.

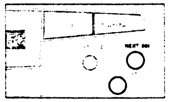
Notes:
- CD play will also start when you select a track with the buttons 0-9 on the remote control.

- The tray will also close if you press PLAY·PAUSE, SHUFFLE or SCAN or gently push against the CD tray.

- CD play also stops if you press OPEN·CLOSE or select another sound source or the end of the CD is reached.

Selecting another track

- Briefly press SEARCH PREV |◀◀ or SEARCH NEXT ▶▶| once/several times to skip to the beginning of the current/previous or next track (on the remote control use the buttons |◀ or ▶| or 0-9).



→ The display shows the selected track number.
→ During play: CD play continues automatically with the selected track.
→ In the stop position: press PLAY·PAUSE to start CD play.

Searching for a passage during CD play

1 Hold down SEARCH PREV |◀◀ or SEARCH NEXT ▶▶| (or ◀◀ or ▶▶ on the remote control) to find a particular passage in the forward or backward direction.
→ The volume is automatically reduced to a low level.

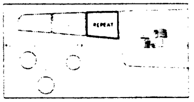
2 Release the button when you have reached the desired passage.

Note: In the shuffle mode and when playing a program, searching is only possible within the track which is playing.

Playing modes: REPEAT / SHUFFLE / SCAN

REPEAT – repeating the entire CD or one track of the CD

1 Repeated pressing REPEAT will cause the display to show the different repeating modes:



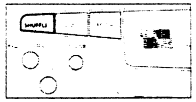
REPEAT -the entire CD is played repeatedly.
REPEAT 1 -the current track is played repeatedly.

→ During play: The selected repeating mode is automatically executed.
→ In the stop position: press PLAY·PAUSE to start CD play.

2 To return to normal CD play, press REPEAT until REPEAT disappears from the display.

SHUFFLE – playing in random order

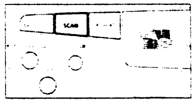
1 Press SHUFFLE (or SHUFFLE / SIDE on the remote control) before or during play.
→ The display indicates SHUFFLE; all the tracks will now be played in a random order.



2 To return to normal CD play, press SHUFFLE (or SHUFFLE / SIDE on the remote control).

SCAN – playing the first 10 seconds of each track

1 Press SCAN before or during play.
→ The display briefly shows SCAN; the first 10 seconds of each track will then be played, beginning with track number 1.



2 To return to normal CD play, press SCAN or PLAY·PAUSE.

Notes:
- You can press both REPEAT and SHUFFLE to repeatedly play the entire CD in random order.

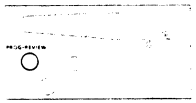
Programming track numbers

You can store up to twenty-five tracks in the memory.

Selecting tracks

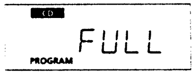
1 Select the desired track with SEARCH PREV |◀◀ or SEARCH NEXT ▶▶| (or |◀ or ▶| or 0-9 on the remote control).

2 As soon as the desired track is displayed, press PROG REVIEW to store the track.
→ For a brief moment the total number of stored tracks and the total playing time of the program will appear on the display.



If the playing time is longer than 100 minutes, the display will show – –:– –.

Note: If you try to store more than 25 tracks, the display will indicate FULL.



Reviewing the program

- Hold down PROG REVIEW for more than 2 seconds.
→ In stop position: all stored track numbers appear in the programmed order on the display.
→ During CD play: all track numbers from the program that still have to be played appear on the display.

Playing the program (from the stop position)

1 Make sure the CD player is set to the stop position (press STOP).

2 Press PLAY·PAUSE (or PLAY ▶ on the remote control).
→ Your program will be played in the selected playing mode (i.e. shuffle).

Selecting another source during CD play

- You can select another sound source during CD play. If you select the CD source again, the CD player will return to the original mode: PLAY, SHUFFLE, SCAN, REPEAT or PROGRAM.
→ CD play will resume at the position where it was interrupted.

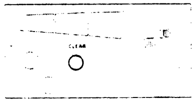
Note: CD play cannot be resumed if the unit has been switched to standby in the meantime.

Erasing the programmed track numbers

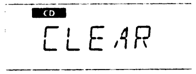
Clearing the program (in the stop position)

1 Press STOP (or STOP ■ on the remote control).
→ The total number of tracks and the total playing time appear.

2 Press CLEAR to clear the program.



→ On the display CLEAR briefly lights up and PROGRAM disappears.



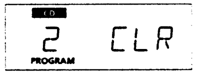
Notes
- Interrupting the power supply or opening the CD tray will also clear the program.

- If you press CLEAR when no program is stored, NO PROG will appear on the display.

Clearing a track from the program (in the stop position)

1 Hold down PROG REVIEW for more than 2 seconds.
→ For 2 seconds each stored track appears successively on the display.

2 As soon as the number you wish to clear is displayed, press CLEAR.
→ The track number to be cleared and CLR appear briefly.



Note: If a track number is selected and displayed while in the stop position and you press CLEAR, this track will be cleared.

CS 52 029

CASSETTE DECKS - general

DCC is the logical, digital successor to Compact Cassette.
It meets higher demands in respect of sound quality, durability and style. DCC is the marriage of Compact Cassette to Digital Audio, and it forms a union that combines perfect sound and high convenience with great versatility.

Like Compact Cassette, DCC is a record and playback system that features both prerecorded and blank DCCs.
With its advanced system of digital registration on tape, DCC is Compact Cassette made digital and totally modernised.

On top of this, DCC has a unique and practical advantage:
it is compatible with its analogue ancestor. Users can play their existing analogue Compact Cassette collections on the new DCC cassette deck.

On your DCC deck (on the right side) you can use Digital Compact Cassettes **(DCC)** for recording and playback and conventional analogue Compact Cassettes **(ACC)** for playback only.

The TAPE deck (on the left side) is designed for ACCs only (recording and playback).

In general, the operation of the DCC deck is the same as that of the TAPE deck with the following differences:

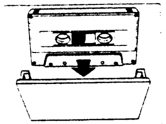
- Recording onto an ACC in the DCC deck is not possible.
- If the track and time information is available, this will be displayed instead of the tape counter.

There are two different types of DCCs:

DCC prerecorded - can be bought prerecorded in the shops and can only be used for playback.
DCC user-recorded - the recording will be made by you.

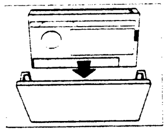
Both DCC types can display information like track numbers, playing times and tape counter.

Inserting a cassette



ACC

1 Press OPEN on the TAPE deck or on the DCC deck to open the respective cassette compartment.
2 Insert the ACC with the open side downwards.

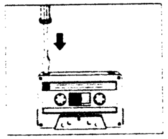


DCC

1 Press OPEN on the DCC deck to open its cassette compartment.
2 Insert the DCC with the protection slider downwards.

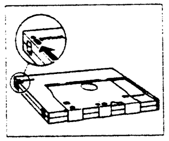
Protecting cassettes against accidental erasure

ACC



- Keep the cassette side to be safeguarded in front of you and break out the left tab. Now, recording on this side is no longer possible.
- To render this safeguard ineffective, cover the aperture with a piece of adhesive tape.

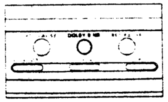
DCC



- Slide the red switch on the back of the cassette upwards. No recording will then be possible on either side of this tape.
- To render this safeguard ineffective, slide the switch downwards.

Dolby B Noise Reduction System

The Dolby B NR System is manufactured under license from Dolby Laboratories Licensing Corporation. The word Dolby and the ◻◻ symbol are trademarks of Dolby Laboratories Licensing Corporation.



- Switch the Dolby B NR system on and off with the DOLBY B NR button.

Notes:
- The Dolby B NR function is only effective with ACC tapes.

- A cassette recorded with the Dolby B NR system should also be played in the Dolby B NR mode. If you forget to operate the DOLBY B NR button, the treble may be reproduced too strongly or too faintly.

- Dolby B NR button has no influence during dubbing. An original cassette recorded with Dolby B NR automatically produces a copy with Dolby B NR.

playback - CASSETTE DECKS

Playing a cassette

1 Press repeatedly DCC/TAPE on the amplifier (DCC or TAPE on the remote control).
→ According to your selection, either DCC or TAPE appears on the display.

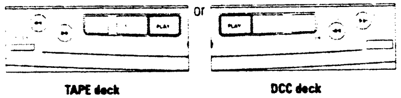
2 Insert a recorded cassette in the deck:
- an ACC into the TAPE deck
- or an ACC or a DCC into the DCC deck.

→ The display shows:
- for the ACC the tape counter;
- for the DCC — —:— because there is no information available yet.

3 Press SIDE on the respective deck or on the remote control to select the front or back side of the tape.
→ FRONT or BACK appears on the display, depending on the side selected.

4 TAPE deck only: if desired, switch on the Dolby NR system by pressing DOLBY B NR.

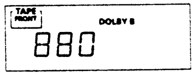
5 Press PLAY on the respective deck (or PLAY ▶ on the remote control) to start playback.



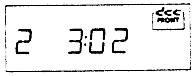
→ After you have pressed the PLAY button, the display will always indicate the following:

Examples

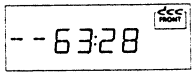
- ***For the ACC:*** the tape counter.



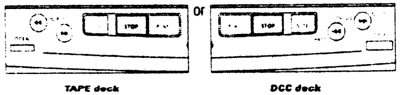
- ***For the pre-recorded DCC:*** the current track number and the elapsed time of the current track.



- ***For the user-recorded DCC:*** the current track number and the total playing time of the tape or, if this data is not available, the tape counter.



6 Press STOP on the respective deck (or STOP ■ on the remote control) if you want to stop playback before the end of the tape.

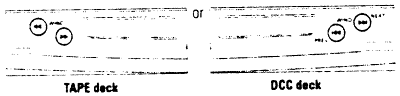


Note: On a pre-recorded DCC you can also start playback by selecting a track with the buttons 0-9 on the remote control.

Fast winding

1 You can wind the tape backwards or forwards:

- TAPE deck: press WIND ◀◀ or ▶▶;
- DCC deck: press ***for more than 1 second*** WIND PREV ⏮ or WIND NEXT ⏭.
- Remote Control: press ◀◀ or ▶▶.



2 Press STOP on the respective deck (or STOP ■ on the remote control) to stop winding.

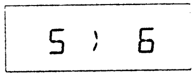
Note: The DCC deck has a TURBO DRIVE system with which DCC tapes are wound at a very high speed.

Selecting another track – DCC only

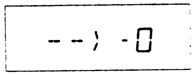
- ***Briefly*** (less than 1 second) press WIND PREV ⏮ or WIND NEXT ⏭ once/several times to wind the tape to the beginning of the current/previous or next track (on the remote control use the buttons ⏮ or ⏭).

Examples

→ If the time and track information is available, the display will indicate the numbers of the current and the selected tracks.



Otherwise, the display will indicate the relative step backwards or forwards from the current position.



→ During playback: after searching, playback continues automatically with the selected track.

→ In the stop position: after searching, press PLAY on the DCC deck (or PLAY ▶ on the remote control) to start playback with the selected track.

General information on recording

- For recording on the TAPE deck you should use an analogue compact cassette of the type NORMAL or CHROME (IEC type **I** or **II**).

- At the very beginning and end of the tape, no recording will take place during the 7 seconds when the leader tape passes the recorder heads.

- When a recording is active, most functions are disabled.
REC ON will appear on the display when a wrong button is pressed.

RECORD
REC ON

- When recording from the tuner onto a DCC, please note that only FM stations can be recorded. On a DCC, MW and LW stations can unfortunately not be recorded.

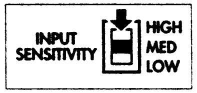
- WAIT can appear in the display for a few of seconds if you stop a DCC recording by pressing STOP ■. During this time the end position of the recording will be marked on the tape.

- Recording is permissible insofar as copyright or other rights of third parties are not infringed.

- Recording level
In general, the recording level is set automatically.
The controls VOLUME, DYNAMIC BASS BOOST, SPATIAL SOUND and DIGITAL SOUND CONTROL do not affect the recording.

When you are recording from an external source (via the AUX/TV IN socket) onto a DCC, OVERLOAD may light up in the display.
If OVERLOAD is permanently displayed, it is advisable to adjust the input level in order to avoid distortion:

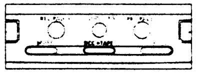
- Move the switch INPUT SENSITIVITY on the back of the unit downwards to a position with lower sensitivity at which the display indication disappears.



Dubbing cassettes (from the DCC deck to the TAPE deck)

1 Insert the cassettes into the decks:
- a blank ACC into the TAPE deck and
- a recorded ACC or DCC into the DCC deck.
Make sure that both cassettes have their full spools on the left.

2 Press DCC ▸TAPE to start cassette dubbing.



- Pressing STOP of either deck (or STOP ■ on the remote control) will stop the dubbing.

Notes:
- To avoid cancelling the recording function, do not press any other deck-related button during dubbing.

Manual recording

1 Press TUNER, CD or AUX/TV to select the desired sound source.

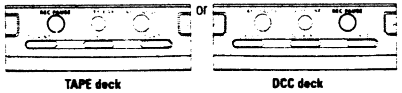
2 Prepare the sound source for recording, for example
- TUNER: tune to the desired radio station (on the DCC deck it is only possible to record FM stations).
- CD: insert a CD and, if desired, program track numbers.

3 Insert a cassette into the deck:
- an ACC into the TAPE deck
- or a DCC into the DCC deck (see **Positioning of the DCC tape**).

4 Press SIDE on the respective deck or on the remote control to select the front or back side of the tape.
→ FRONT or BACK appears on the display, depending on the side selected.

5 TAPE deck only: If desired, switch on the Dolby NR system by pressing DOLBY B NR.

6 Press REC PAUSE on the respective deck to prepare the deck for recording.



→ RECORD starts flashing on the display.

7 Press PLAY on the respective deck or (PLAY ▶ on the remote control) to start recording.

8 To stop recording, press STOP on the respective deck (STOP ■ on the remote control).

Positioning of the DCC tape

There are four possibilities to position the tape before you start recording. The tape position influences the recording result of track and time information as follows:

a) At the very beginning of the tape (rewind the tape by pressing WIND PREV ◂◂ for more than 1 second):
the track and time information is available to the DCC deck and can therefore be recorded and displayed correctly.

b) Directly after an existing recording (find this position by briefly pressing WIND NEXT ▸▸|):
the track and time information is available to the DCC deck (works only if track and time information of the old recording is available) and can therefore be recorded and displayed correctly.

c) At a position where a recording already exists:
only the time information is available to the DCC deck (works only if time information of the old recording is available) and can therefore be recorded and displayed correctly.

d) At a blank area:
neither the time nor track information is available to the DCC deck and can therefore not be recorded or displayed at all.

CD SYNCHRO – synchronised start of recording and CD play

We recommend to use this recording method when recording from a **CD to a DCC**. This will ensure that the track and time information is recorded and displayed correctly.
When copying a CD to an ACC you can of course also use the CD SYNCHRO feature.

1 Insert a CD and, if desired, program track numbers.

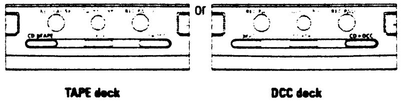
2 Insert a blank cassette into the deck:
- an ACC into the TAPE deck
- or a DCC into the DCC deck.

3 Select the front side for recording by pressing SIDE on the respective deck or on the remote control.
→ FRONT is indicated on the display.

4 Rewind the tape to the beginning by pressing WIND PREV ◂◂ for more than 1 second.

5 TAPE deck only: if desired, switch on the Dolby NR system by pressing DOLBY B NR.

6 Start the recording on the respective deck by pressing
- CD ▸TAPE for the TAPE deck
- or CD ▸DCC for the DCC deck.



→ Recording will start. On a DCC, the track and time information will also be recorded.
→ With a delay of 7 seconds (leader tape of the cassette), playing of the CD or program starts automatically.
→ At the end of the first side (FRONT), the deck automatically selects the back side (BACK) to continue recording.

- To cancel the recording, press STOP on the respective deck or STOP or OPEN-CLOSE on the CD player (or STOP ■ on the remote control).

Note:
If a track is only partly recorded at the end of the front side of an ACC or a DCC, the recording will start again with the same track on the back side of the tape. On a DCC however, in order to omit playback of this partly recorded track, the DCC deck will automatically:
1. return to the beginning of the track
2. mark this position on the tape
3. select the back side
4. start recording with the same track.

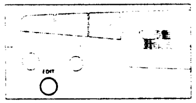
In order to obtain the same result on an ACC, we recommend use of the EDIT feature.

EDIT – automatic CD track selection by specifying the tape length

We recommend to use this recording method when recording from a **CD to an ACC.** However, it can only be used for CDs with a maximum of 29 tracks.
When copying a CD to a DCC you can of course also use the EDIT feature.

1 Proceed as described in the chapter CD SYNCHRO, step 1 to 5.

2 Press EDIT on the CD player.
→ EDIT and C 60 appear on the display.



3 Use SEARCH PREV |◂◂ or SEARCH NEXT ▸▸| on the CD player to find the desired tape length (on the remote control use the buttons |◂ or ▸| or 0-9).
→ The display successively shows:
C60–C90–C100–C120–C30–C45–C60–...

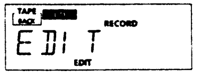
4 Press EDIT to confirm the tape length (= recording time).
→ The unit automatically selects the total number of tracks that will fit onto each tape side.
The original order of tracks will not be changed.
→ The display briefly shows the recording time for side A and B.

5 Start the recording by pressing
CD ▸TAPE for the TAPE deck or, CD ▸DCC for the DCC deck..
→ Recording will start. On a DCC, the track and time information will also be recorded.
→ With a delay of 7 seconds (leader tape of the cassette), playing of the CD or program starts automatically.
→ At the end of the first side (FRONT), the deck automatically selects the back side (BACK) to continue recording.

- To cancel the recording, press STOP on the respective deck or STOP or OPEN-CLOSE on the CD player (or STOP ■ on the remote control).

Checking the recording times
- During EDIT recording, hold down PROG REVIEW for more than 2 seconds.
→ The recording time for both tape sides appears on the display.

Note: During EDIT recording, all CD buttons other than STOP, OPEN-CLOSE or PROG REVIEW are disabled. EDIT appears on the display when a wrong button is pressed.

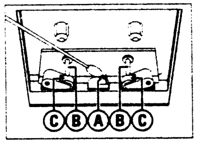


GENERAL INFORMATION

Maintenance

- Do not expose the set, CDs or cassettes to humidity or rain, sand or to excessive heat.
- You can clean the set with a soft, slightly dampened chamois leather. Do not use any cleaning agents as they may have a corrosive effect.
- Do not push the tape protection of DCC cassettes aside, and avoid touching the tape.
- Keep the cassettes at room temperature and avoid leaving them in the sun or too close to magnets and transformers of e.g. recorders, radios, TVs or loudspeakers.

TAPE deck



To ensure a good recording and playback quality, clean the head Ⓐ, the capstans Ⓑ and the rubber pressure rollers Ⓒ after approx. 50 hours of operation.

- Use a cotton bud slightly moistened with alcohol or a special head cleaning fluid.

Note: Cleaning of the heads Ⓐ can also be done by playing a cleaning cassette through once.

DCC deck

- In principle there is no need to clean the head of your DCC player if you only use DCC cassettes.

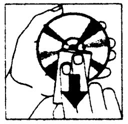
  The use of conventional ACC cassettes of inferior quality may leave dirt on the DCC head. This can affect the sound quality of DCC cassettes (sound is being interrupted).

  Special DCC cleaning cassettes are available to clean the DCC head. You are strongly advised not to use conventional compact cleaning cassettes, as they will not clean the DCC head well enough.

- **Do not use demagnetizing cassettes !**

CD player and CD handling

- The lens may cloud over when the set is suddenly moved from cold to warm surroundings. Playing a CD is then not possible. Leave the set in a warm environment until the moisture evaporates.
- Always pick up the CD by the edge and put it back in its box after use.
- To clean the CD, wipe in a straight line from the centre towards the edge using a soft, lint-free cloth. A cleaning agent may damage the CD!
- Never write on a CD or attach any sticker to it.



This product complies with the radio interference requirements of the EU (European Union).

Technical data *(subject to modification)*

AMPLIFIER

Output power:		2x 27 W RMS/6 Ω/THD 10%
Power bandwidth:		63 - 17,000 Hz
Frequency response:		63 - 17,000 Hz
Signal-to-noise ratio:		≥ 67 dBA (IEC)
Input sensitivity	low	1,5 V rms
	med	500 mV rms
	high	150 mV rms
Output Loudspeakers:		≥ 6 Ω
Output Headphones:		32 Ω - 1000 Ω

TUNER

FM wave range:		87.5 - 108 MHz
MW wave range:		522 - 1611 kHz
LW wave range		153 - 279 kHz
Sensitivity at 75 Ω	- mono, 26 dB signal-to-noise ratio:	1,7 µV
	- stereo, 46 dB, signal-to-noise ratio:	45 µV
Selectivity:		≥ 24 dB
Total harmonic distortion:		≤ 7%
Frequency response:		63 - 12.5 kHz (± 3 dB)
Signal-to-noise ratio:		≥ 50 dBA

CD PLAYER

Frequency range:	20 - 20,000 Hz
Signal-to-noise ratio:	90 dBA
Channel separation	60 dBA
Total harmonic distortion:	≥ 75 dB
Conversion:	Bitcheck Continuous calibration

TAPE DECK

Frequency response:	CrO2 tape (type II):	100 - 12,500 Hz (within 5 dB)
	Normal tape (type I):	100 - 12,500 Hz (within 5 dB)
Signal-to-noise ratio (without Dolby NR)		≥ 44 dBA
Wow and flutter:		≤ 0.4% DIN

DCC DECK

D/A-Part (playback)

Frequency response:	fs = 32 kHz : 20 - 14,500 Hz fs = 44 kHz : 20 - 20,000 Hz fs = 48 kHz : 20 - 22,500 kHz Analogue: 40 - 14,000 Hz (3 dB)
Signal-to-noise ratio:	≥ 100 dBA
Crosstalk	≥ 85 dB
Dynamic range:	≥ 100 dB
THD and noise:	≥ 75 dB
Conversion:	Bitstream
Wow and flutter	analogue: —— digital: quartz precision

A/D-Part (recording)

Frequency response:	fs = 44 kHz : 20 - 20,000 Hz
Crosstalk	≤ -85 dB
Dynamic range:	≥ 90 dB
THD and noise:	≤ -75 dB
Conversion:	Bitstream

Loudspeaker boxes

3-Way bass reflex

5 1/4 inch woofer / 2 1/2 inch midrange / Piezo tweeter

Dimensions (wxhxd):	180 x 356 x 222.5 mm

Cabinet

Dimensions (wxhxd):	240 x 309 x 300 mm
Weight (with/without speakers):	approx. 14/8 kg

TROUBLESHOOTING

- If a fault occurs, first check the points listed below before taking the set for repair.
- If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

WARNING:

Under no circumstances should you try to repair the set yourself, as this will invalidate the guarantee.

PROBLEM	POSSIBLE CAUSE	REMEDY
No power	Mains lead is not securely connected.	Connect the mains lead properly.
No or poor sound	VOLUME is not adjusted.	Adjust the VOLUME.
	Loudspeakers are wrongly or not connected.	Check the speaker connections.
	Headphones are connected.	Disconnect headphones.
Reversed left and right sound	Loudspeakers are wrongly connected.	Connect the loudspeaker cables correctly.
No reaction to operation of keys	Electrostatic discharge.	Disconnect the set from power supply and reconnect it after a few seconds.
	A recording is active.	Stop the recording or wait until it is finished.
Poor radio reception	STEREO indicator flashes.	Adjust the antenna.
	FM antenna is not connected.	Connect the FM antenna.
	Interference caused by the vicinity of electrical equipment like TVs, video recorders, computers, thermostats, fluorescent lamps (TL), engines, etc.	Keep the set away from electrical equipment.
'NO DISC' indication	CD is badly scratched or dirty.	Replace or clean the CD, see maintenance.
	No CD inserted.	Insert a CD.
	CD inserted upside down.	Insert a CD with label upwards.
	Laser lens is steamed up.	Wait until the lens has acclimatized.
The CD skips tracks	CD is damaged or dirty.	Replace or clean the CD.
	SHUFFLE or PROGRAM mode is active.	Switch off SHUFFLE or PROGRAM mode.
Poor ACC sound quality	Dust and dirt on the heads, capstan or pressure roller.	Clean the heads, capstan and pressure roller, see maintenance.
Interruptions in DCC sound and 'CLEAN' indication	Dirt on the DCC head.	Clean the DCC head by using a special DCC cleaning cassette.
Recording does not work	Cassette is protected against recording.	Render this safeguard ineffective.
	No recording source is selected.	Select the source to be recorded from.
	You have inserted an ACC in the DCC deck ('NO DCC' indication).	Insert a DCC instead.
	You have inserted a prerecorded DCC in the DCC deck.	You cannot make a recording on a prerecorded DCC.
TIMER and NEWS do not work	A recording is active.	Stop the recording or wait until it is finished.
Remote control does not work	The distance between set and remote control is too large.	Reduce the distance.
	Wrong sound source is selected.	Select the sound source before pressing the functional button.
	Batteries are incorrectly inserted.	Insert the batteries correctly.
	Batteries are exhausted.	Insert fresh batteries.

Warnings & Safety

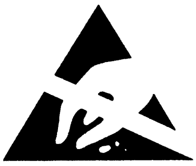
(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

ESD



(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderm. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delàpparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

SAFETY

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.
Safety components are marked by the symbol ⚠

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.
Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(I)

Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.
Componenty di sicurezza sono marcati con ⚠

(F)

Les normes de sécurité exigent que l´appareil soit remis à l´état d´origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.
Les composants de sécurité sont marqués ⚠

(NL)

Veiligheidsbepalingen verelsen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.
De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(FIN) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen !

(F)

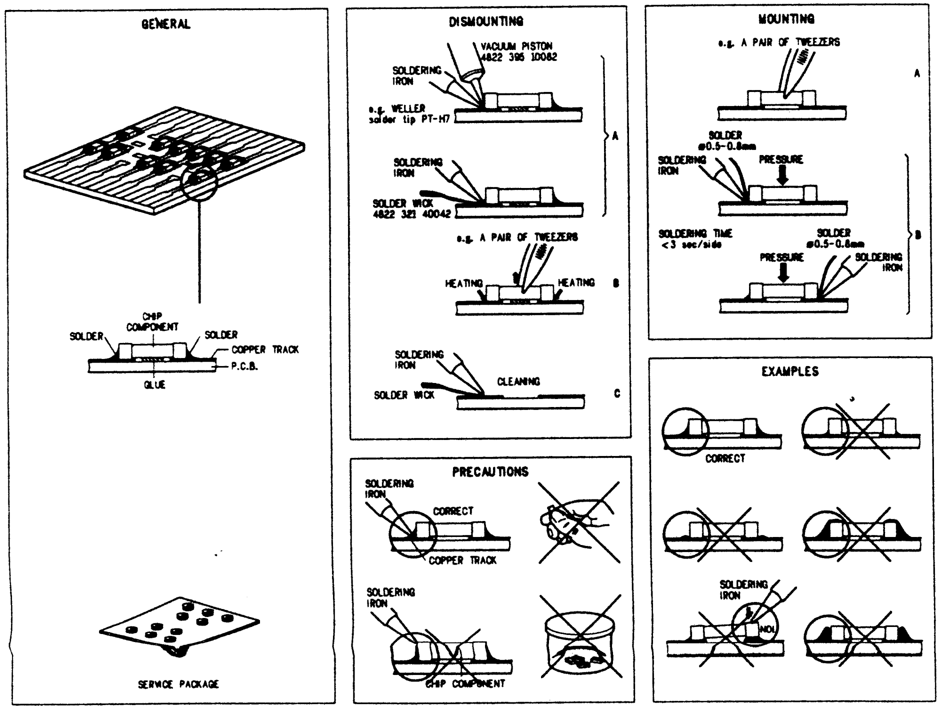
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

Service Hints

Service Tools

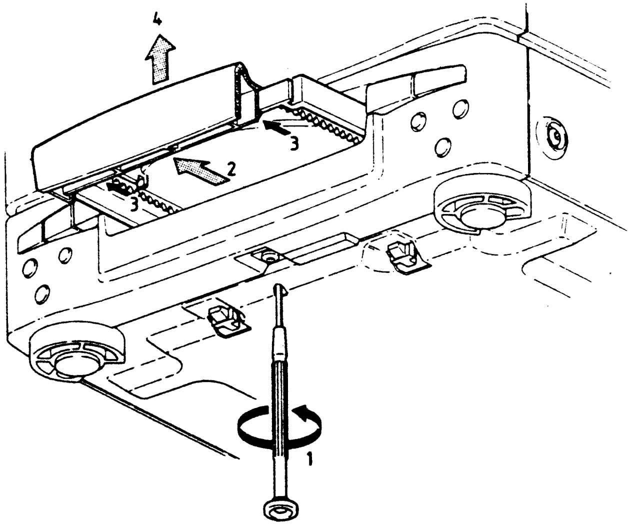
TORX screwdriver set SBC 163	4822 295 50145
Audio signal disc SBC 429	4822 397 30184
Test disc 5 (disc without errors) + **Test disc 5A** (disc with dropout errors, black spots and fingerprints) SBC 426/426A	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without "pause")	4822 397 30155
Universal test cassette Fe SBC 420	4822 397 30071
Universal test cassette CrO2 SBC 419	4822 397 30069

Handling Chip Components

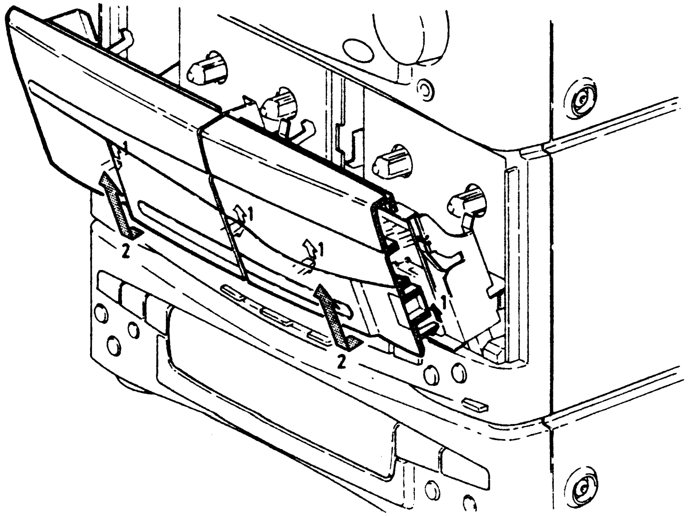

GENERAL
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
SOLDERING IRON
SOLDER WICK 4822 321 40042
A
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
CLEANING
SOLDER WICK
C
PRECAUTIONS
SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER ⌀0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME <3 sec/side
SOLDER ⌀0.5-0.8mm
PRESSURE
SOLDERING IRON
B
EXAMPLES
CORRECT
SOLDERING IRON
NOL

Dismantling Instructions

Dismantling the Front of CD Tray

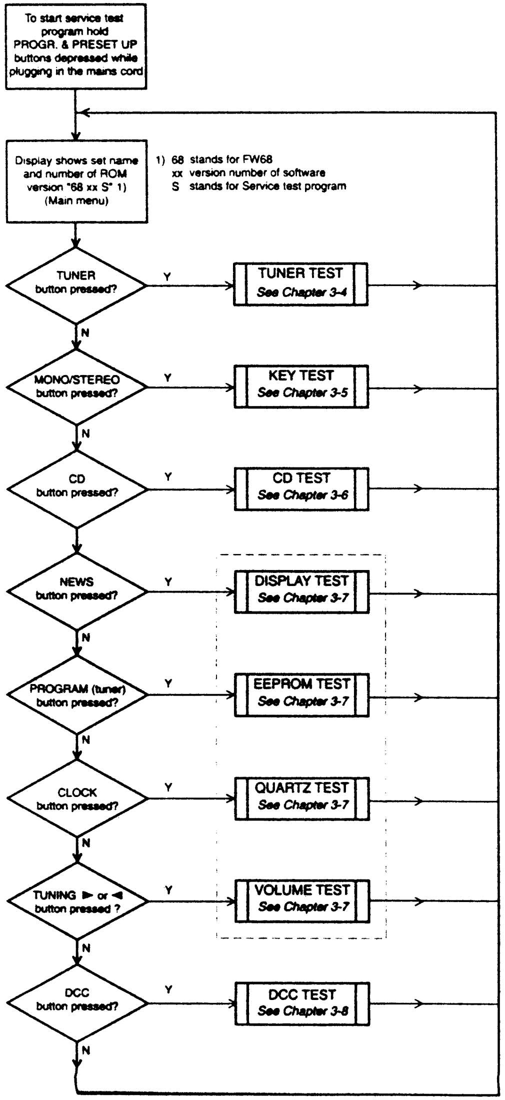


Dismantling the Cassette Doors



SERVICE TEST PROGRAM MAIN PROGRAM

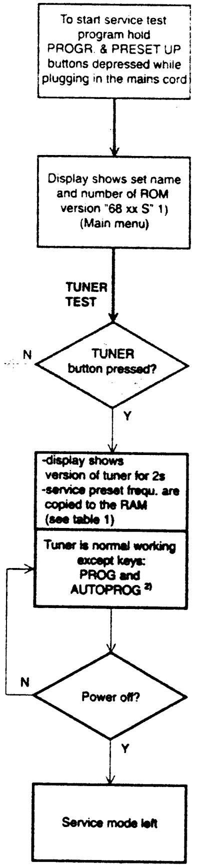
The service test programm can be left:
- at each step: by switching power off (disconnect mains)


To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
Display shows set name and number of ROM version "68 xx S" 1) (Main menu)
TUNER button pressed?
Y
TUNER TEST See Chapter 3-4
N
MONO/STEREO button pressed?
Y
KEY TEST See Chapter 3-5
N
CD button pressed?
Y
CD TEST See Chapter 3-6
NEWS button pressed?
Y
DISPLAY TEST See Chapter 3-7
N
PROGRAM (tuner) button pressed?
Y
EEPROM TEST See Chapter 3-7
N
CLOCK button pressed?
Y
QUARTZ TEST See Chapter 3-7
N
TUNING ► or ◄ button pressed ?
Y
VOLUME TEST See Chapter 3-7
N
DCC button pressed?
Y
DCC TEST See Chapter 3-8
N

1) 68 stands for FW68
xx version number of software
S stands for Service test program

SERVICE TEST PROGRAM TUNER TEST

The service test programm can be left:
- at each step: by switching power off (disconnect mains)


To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
Display shows set name and number of ROM version "68 xx S" 1) (Main menu)
TUNER TEST
N
TUNER button pressed?
Y
-display shows version of tuner for 2s -service preset frequ. are copied to the RAM (see table 1)
Tuner is normal working except keys: PROG and AUTOPROG 2)
N
Power off?
Y
Service mode left

1) 68 stands for FW68
xx version number of software
S stands for Service test program

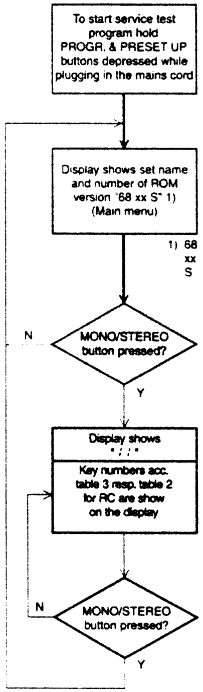
Table 1

PRESET	Europe "EUR"	East Europe "EAS"	USA "USA"	Oversea "OSE"	Japan "JAP"
1	108MHz	108MHz	108MHz	108MHz	90MHz
2	87,5MHz	65,81MHz	87,5MHz	87,5MHz	76MHz
3	1611kHz	1611kHz	1710kHz	1710kHz	1629kHz
4	522kHz	522kHz	530kHz	530kHz	522kHz
5	279kHz	279kHz	-	-	-
6	153kHz	153kHz	-	-	-
7	98MHz	98MHz	98MHz	98MHz	80MHz
8	558kHz	558kHz	560kHz	560kHz	558kHz

2) Preset frequencies of table 1 can be used as in normal tuner mode. If fieldstregth is high enough "PROGRAM" flag will light. Preset frequencies stored by the customer are still stored in the EEPROM and can be recalled by a reset of the µP (switching power off by disconnecting mains cord)

SERVICE TEST PROGRAM KEY TEST

The service test programm can be left:
– **at each step:** by switching power off (disconnect mains)


To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
Display shows set name and number of ROM version '68 xx S" 1) (Main menu)
MONO/STEREO button pressed?
N
Y
Display shows
" ; ; "
Key numbers acc. table 3 resp. table 2 for RC are show on the display
MONO/STEREO button pressed?
N
Y

1) 68 stands for FW68
xx version number of software
S stands for Service test program

Table 2
valid for Remote Control

	TUNER MODE	CD MODE	DCC MODE	TAPE MODE
Key activated	Display shows	Display shows	Display shows	Display shows
1	103 RC	78 RC	89 RC	-
2	104 RC	79 RC	90 RC	-
3	105 RC	80 RC	91 RC	-
4	106 RC	81 RC	92 RC	-
5	107 RC	82 RC	93 RC	-
6	108 RC	83 RC	94 RC	-
7	109 RC	84 RC	95 RC	-
8	110 RC	85 RC	96 RC	-
9	111 RC	86 RC	97 RC	-
0	102 RC	77 RC	88 RC	-
SIDE/SHUFFLE	-	47 RC	61 RC	35 RC
PLAY	-	26 RC	48 RC	36 RC
STOP	-	60 RC	41 RC	37 RC
◀◀	-	32 RC	01 RC	34 RC
▶▶	-	31 RC	00 RC	33 RC
|◀	-	30 RC	46 RC	-
▶|	-	29 RC	45 RC	-
DSC	73 RC	73 RC	73 RC	73 RC
VOL UP	74 RC	74 RC	74 RC	74 RC
VOL DOWN	75 RC	75 RC	75 RC	75 RC
STANDBY	19 RC	19 RC	19 RC	19 RC
TUNER	20 RC	20 RC	20 RC	20 RC
TAPE	99 RC	99 RC	99 RC	99 RC
DCC	98 RC	98 RC	98 RC	98 RC
TV	-	-	-	-
DISC	-	-	-	-
CD	09 RC	09 RC	09 RC	09 RC

Table 3
valid for set buttons

Key activated	Display shows	Key activated	Display shows	Key activated	Display shows
Timer	14	ACC Fast Forward	33	Tuning up	02
News	15	ACC Side	35	Tuning down	06
Set	16	ACC Stop	37	Bass Boost	03
Band	13	ACC Play	36	Spatial Sound	07
Clock set	12	ACC Rec Pause	38	DCC Rec Pause	40
Mono	11	Dolby B Nr	39	DCC→Tape	43
CD	09	CD→Tape	44	CD→DCC	42
Tunse	20	Shuffle	61	DCC Play	48
DCC / Tape	10	Scan	62	DCC Stop	41
AUX/TV	04	Repeat	54	DCC Side	47
Power / Standby	08	CD Prog-Review	53	DCC Previous	46
Classic	23	Clear	58	DCC Next	45
Pop	22	Edit	57	CD Stop	60
Rock	25	Preset down	17	CD Play	56
Jazz	21	Preset up	18	Open/Close	64
Flat	24	Tuner Program	01	CD Next	55
ACC Rewind	34	Auto Prog	05	CD Previous	59

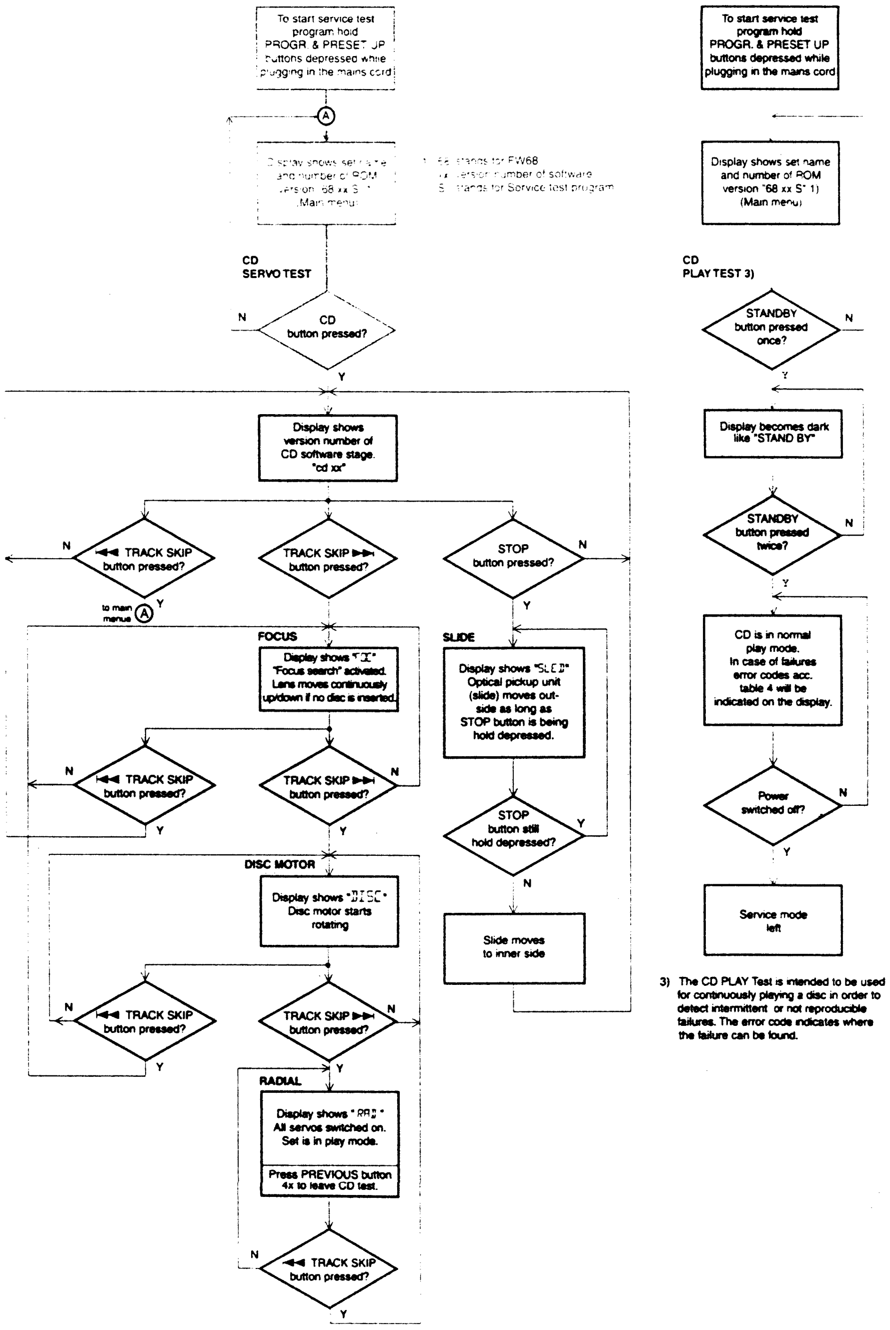
Table 4
Possible errors in CD PLAY MODE

Error number	Error description	Error type
1002	Focus Error. Triggered when the focus could not found within a certain time when starting up the CD or when the focus is lost for more than a certain time during playing the CD.	F
1007	Subcode Error. No subcode could have been read, even not after retrying 10 times to restart the PLL and jumping 10 tracks. When this happens the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W
1008	Out of lead-in during reading TOC Triggered when during reading the TOC the lead-in (track nr. 0) is left. This can be caused by a misaligned inner-switch or by a disc with a mispositioned lead-in.	W
1010	Radial error Triggered when the radial servo is not on track for a certain time during playing the CD.	F
1011	Sledge error Generated when the inner-switch did not open within a certain time when the pick up is moved from the inner position outside.	W
1012	Fatal sledge error Generated when the inner-switch did not close within a certain time when the pick up is moved inside. Inner-switch ore sledge motor problems.	F
1013	Turntable motor error. Generated when the CD did not reach 75% of speed during startup within a certain time. Discmotor problem.	F
1020	PLL lock error. When the PLL did not lock after 10 retries then this warning message is generated and the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W

Error Type:
F = Fatal error → Set stops operation, message remains on the display
W = Warning → Set continuous operation, message remains on the display until next error.

SERVICE TEST PROGRAM CD TEST

The service test programm can be left:
- at each step: by switching power off (disconnect mains)

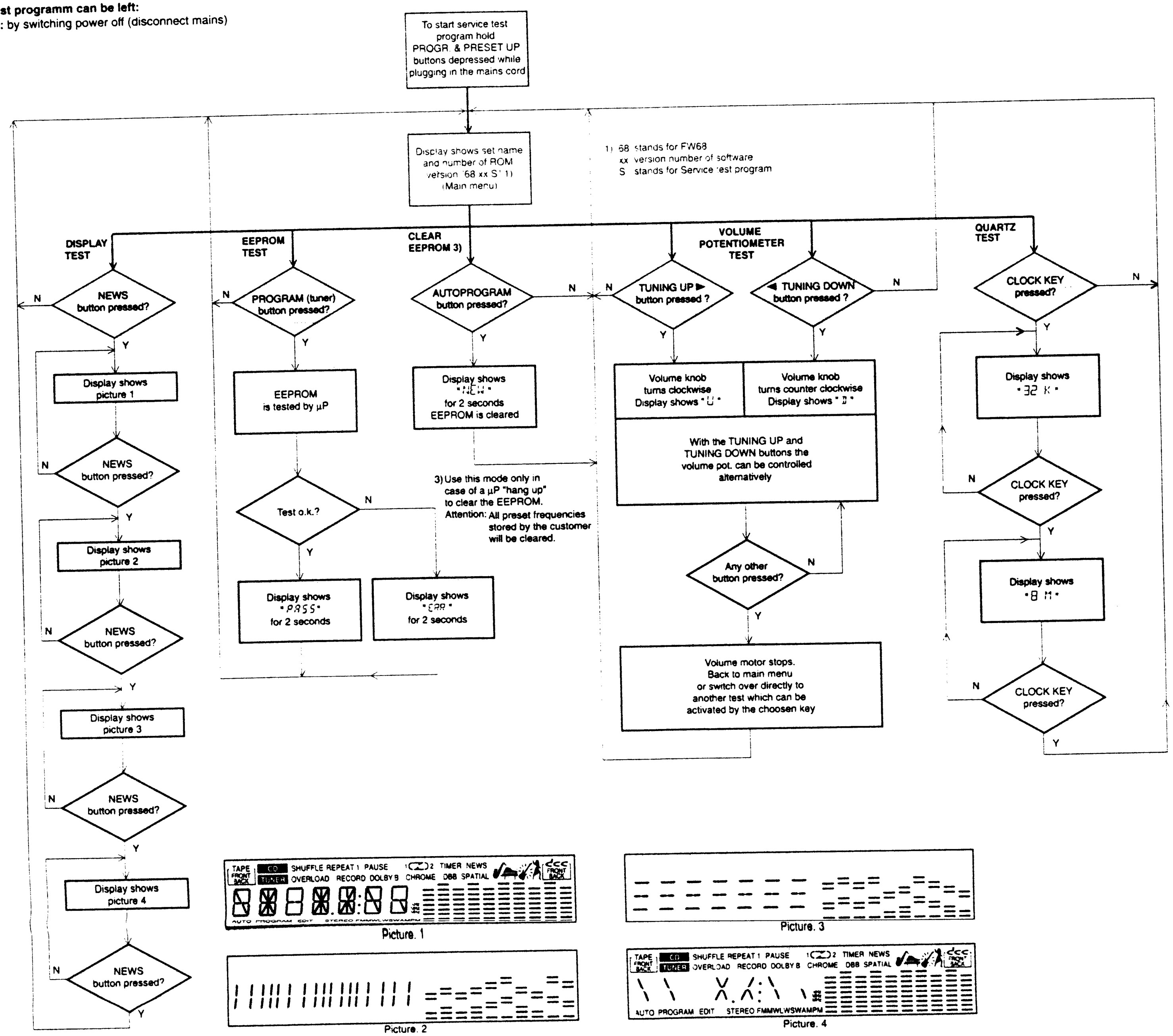

To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
A
Display shows set name and number of ROM version "68 xx S" 1) (Main menu)
CD SERVO TEST
CD button pressed?
N
Y
Display shows version number of CD software stage. "cd xx"
◄◄ TRACK SKIP button pressed?
TRACK SKIP ►►I button pressed?
STOP button pressed?
to main menue A
FOCUS
Display shows "FI" "Focus search" activated. Lens moves continuously up/down if no disc is inserted.
SLIDE
Display shows "SLED" Optical pickup unit (slide) moves outside as long as STOP button is being hold depressed.
STOP button still hold depressed?
Slide moves to inner side
DISC MOTOR
Display shows "DISC" Disc motor starts rotating
RADIAL
Display shows "RAD" All servos switched on. Set is in play mode.
Press PREVIOUS button 4x to leave CD test.
To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
Display shows set name and number of ROM version "68 xx S" 1) (Main menu)
CD PLAY TEST 3)
STANDBY button pressed once?
Display becomes dark like "STAND BY"
STANDBY button pressed twice?
CD is in normal play mode. In case of failures error codes acc. table 4 will be indicated on the display.
Power switched off?
Service mode left

1) 68 stands for FW68
xx version number of software
S stands for Service test program

3) The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittent or not reproducible failures. The error code indicates where the failure can be found.

SERVICE TEST PROGRAM DISPLAY, EEPROM, VOLUME, QUARTZ

The service test programm can be left:
– at each step: by switching power off (disconnect mains)


To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
Display shows set name and number of ROM version '68 xx S' 1) (Main menu)
DISPLAY TEST
EEPROM TEST
CLEAR EEPROM 3)
VOLUME POTENTIOMETER TEST
QUARTZ TEST
NEWS button pressed?
N
Y
Display shows picture 1
NEWS button pressed?
Display shows picture 2
NEWS button pressed?
Display shows picture 3
NEWS button pressed?
Display shows picture 4
NEWS button pressed?
PROGRAM (tuner) button pressed?
EEPROM is tested by µP
Test o.k.?
Display shows "PASS" for 2 seconds
Display shows "ERR" for 2 seconds
AUTOPROGRAM button pressed?
Display shows "NEW" for 2 seconds EEPROM is cleared
TUNING UP ► button pressed ?
◄ TUNING DOWN button pressed ?
Volume knob turns clockwise Display shows "U"
Volume knob turns counter clockwise Display shows "D"
With the TUNING UP and TUNING DOWN buttons the volume pot. can be controlled alternatively
Any other button pressed?
Volume motor stops. Back to main menu or switch over directly to another test which can be activated by the choosen key
CLOCK KEY pressed?
Display shows "32 K"
CLOCK KEY pressed?
Display shows "8 M"
CLOCK KEY pressed?
TAPE FRONT BACK CD TUNER SHUFFLE REPEAT 1 PAUSE 2 TIMER NEWS OVERLOAD RECORD DOLBY B CHROME DBB SPATIAL
AUTO PROGRAM EDIT STEREO FMMWLWSWAMPM

Picture. 1

Picture. 2

Picture. 3

Picture. 4

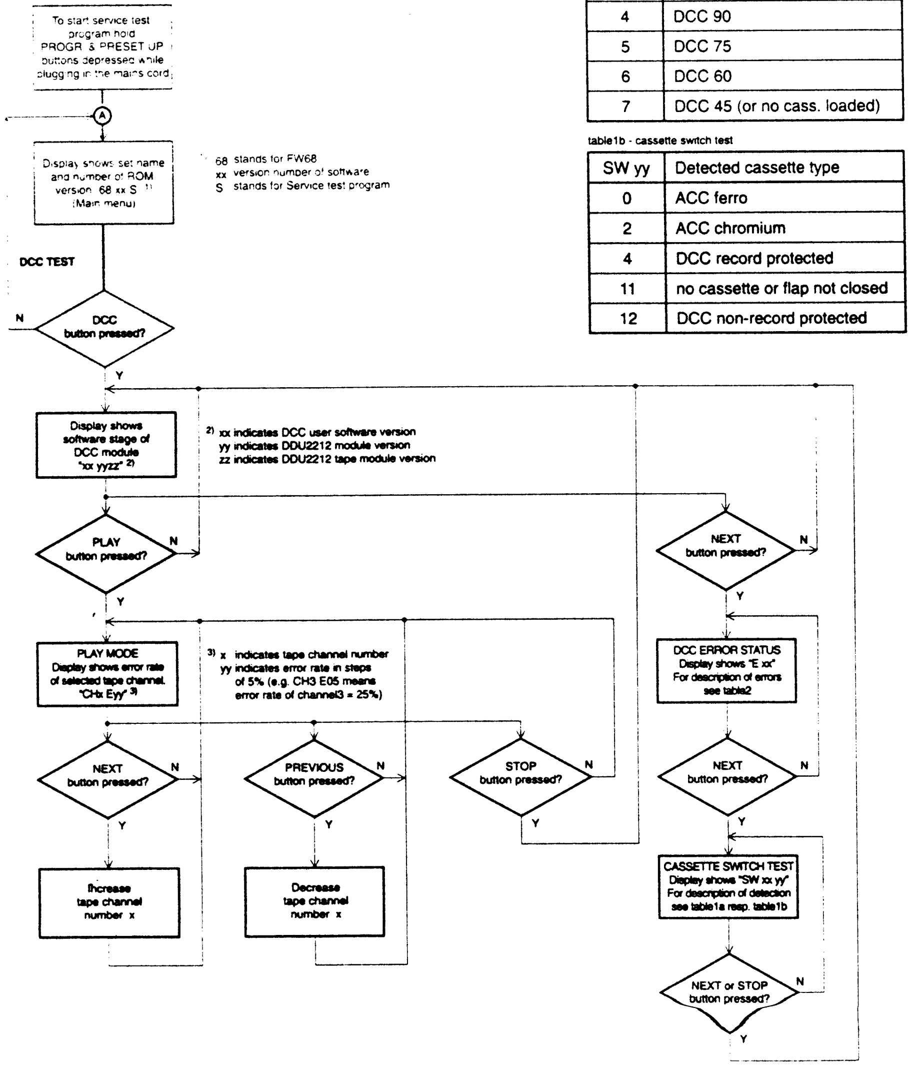
1) 68 stands for FW68
xx version number of software
S stands for Service test program

3) Use this mode only in case of a µP "hang up" to clear the EEPROM.
Attention: All preset frequencies stored by the customer will be cleared.

SERVICE TEST PROGRAM DCC TEST

The service test programm can be left:

- at each step: *by switching power off (disconnect mains)*


To start service test program hold PROGR & PRESET UP buttons depressed while plugging in the mains cord
A
Display shows set name and number of ROM version 68 xx S 1) (Main menu)
DCC TEST
N
DCC button pressed?
Y
Display shows software stage of DCC module "xx yyzz" 2)
PLAY button pressed?
N
Y
PLAY MODE Display shows error rate of selected tape channel. "CHx Eyy" 3)
NEXT button pressed?
N
Y
Increase tape channel number x
PREVIOUS button pressed?
N
Y
Decrease tape channel number x
STOP button pressed?
N
Y
NEXT button pressed?
N
Y
DCC ERROR STATUS Display shows "E xx" For description of errors see table2
NEXT button pressed?
N
Y
CASSETTE SWITCH TEST Display shows "SW xx yy" For description of detection see table1a resp. table1b
NEXT or STOP button pressed?
N
Y

1) 68 stands for FW68
xx version number of software
S stands for Service test program

2) xx indicates DCC user software version
yy indicates DDU2212 module version
zz indicates DDU2212 tape module version

3) x indicates tape channel number
yy indicates error rate in steps of 5% (e.g. CH3 E05 means error rate of channel3 = 25%)

table1a - cassette switch test

SW xx	Detected cassette length
0	DCC prerecorded
1	DCC undefined length
2	DCC 120
3	DCC 105
4	DCC 90
5	DCC 75
6	DCC 60
7	DCC 45 (or no cass. loaded)

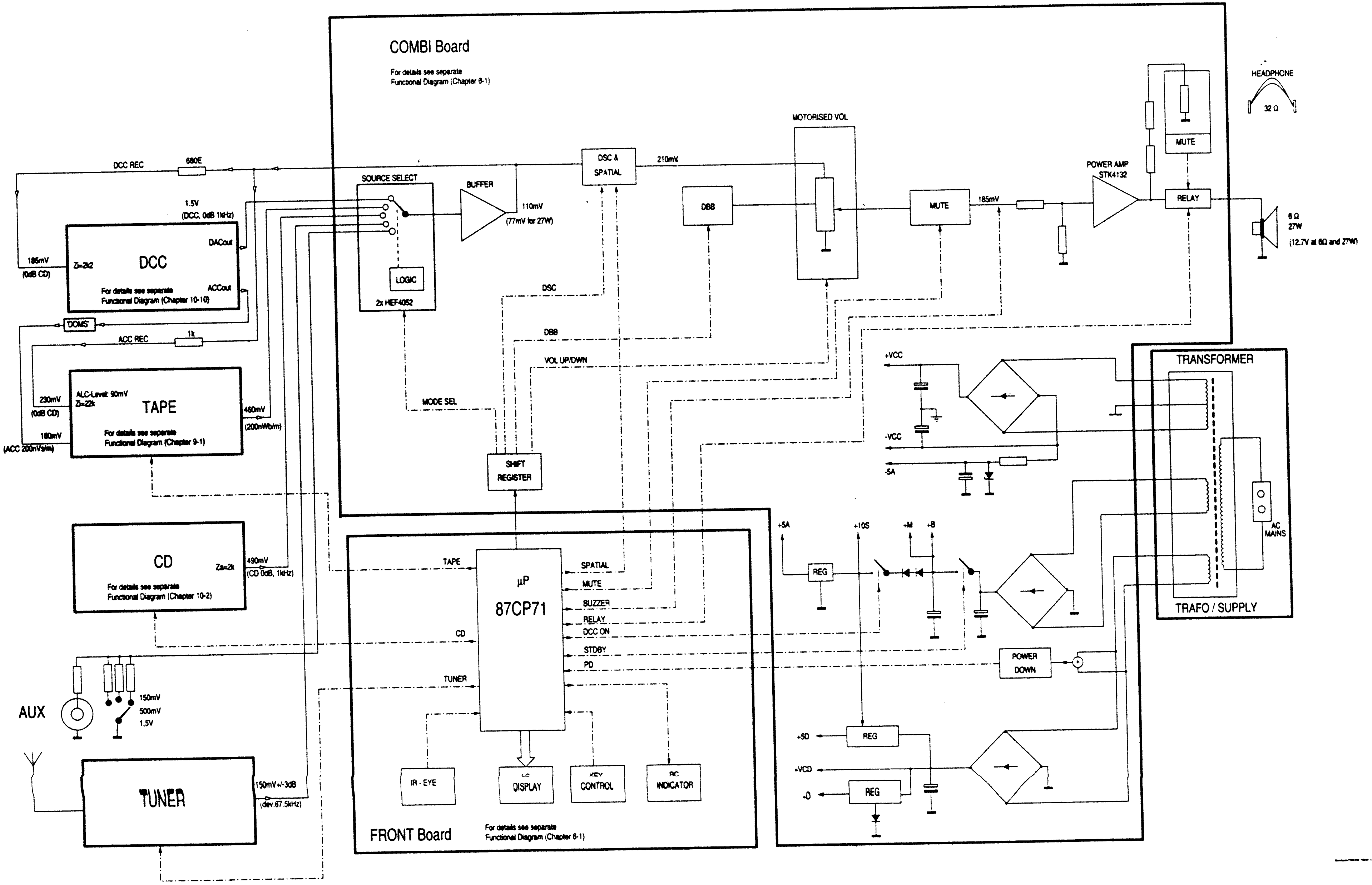
table1b - cassette switch test

SW yy	Detected cassette type
0	ACC ferro
2	ACC chromium
4	DCC record protected
11	no cassette or flap not closed
12	DCC non-record protected

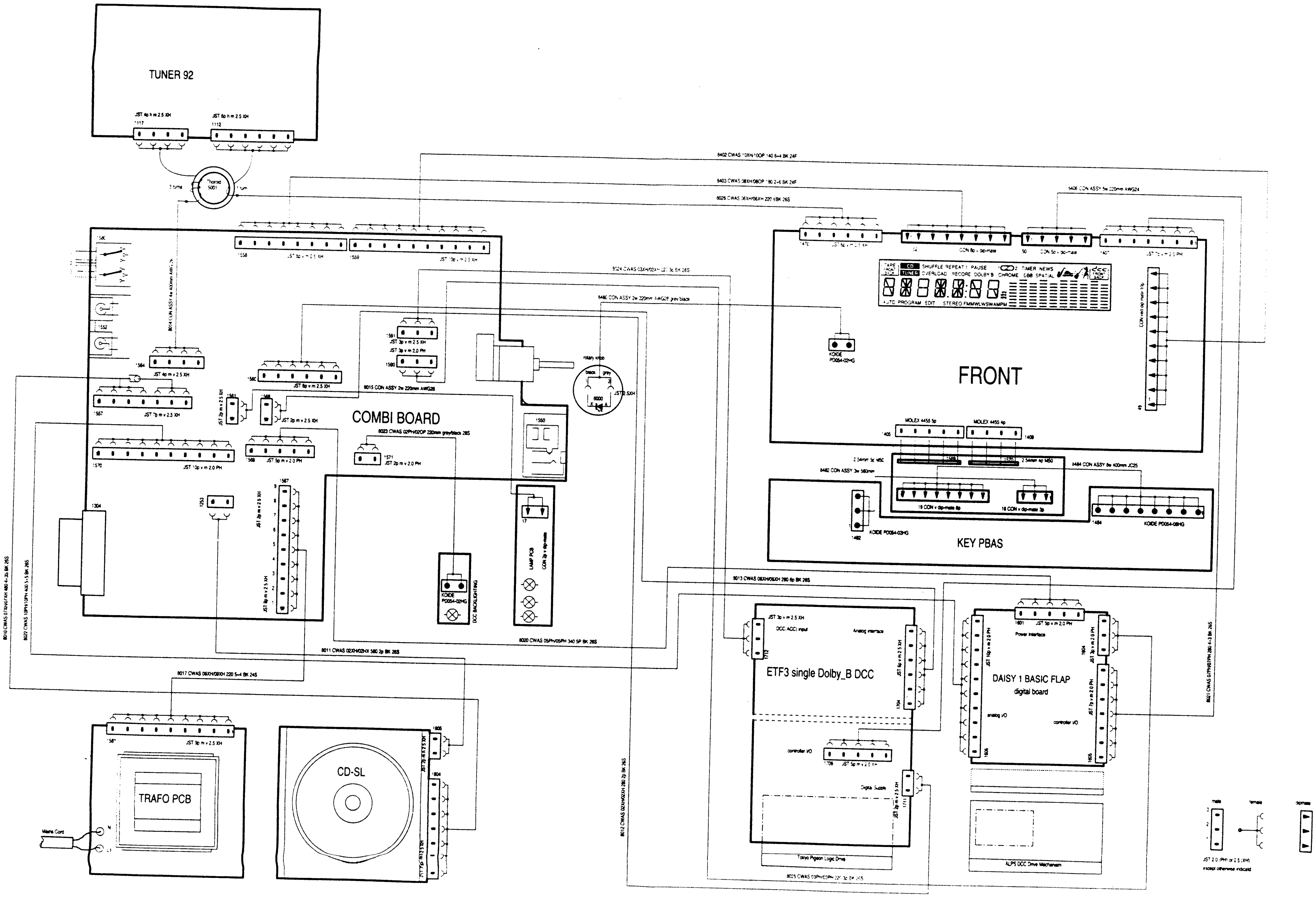
table2 - DCC error status

Error number	Error description
0	No Error
1	Deck failed The requested command could not be executed because of a malfunction of the mechanics.
3	Tray pulled open During normal operation the tape drive module has sensed that the tray loader is forced to the open state by the user. In case of the DDU2212, this error will be issued when the user opens the flap by pressing the eject button.
4	Invalid parameter The parameter going with the last received command is unknown or out of range.
5	No cassette The command can not be executed since there is no cassette loaded.
11	Record attempt on write protected tape A record or auxilliary record or record-pause command is issued while the loaded cassette is write protected or is an ACC. The DDU2212 module will refuse to record on such a tape.
13	Invalid command received The command which was received is not known or not allowed in this context.
15	Command overrun The DDU2212 module has received too many state changing commands in a row to handle. This error occurs whenever a command is received while another command is still waiting for execution. The DDU2212 module will not store a queue of received commands.
16	Signature not yet loaded The record command will only be accepted by the DDU2212 module after the setmakers signature has been loaded. This enables to identify the recording set of each DCC cassette.
17	Unreliable TOC During the process of TOC search the DDU2212 module found out that the contents of the TOC does not match the contents of the tape. The search command should be repeated using relative search.
18	Search target could not be found The requested search target was valid but could not be found, e.g. a direct track search after track number 5 on a super-user tape while track number 5 was removed by after recoding.
19	Marker writing not allowed A request for a marker can be rejected because of the fact that the last recorded marker is not yet 8 tape frames past or a marker is currently being written or the tape is write protected. Also when the requested marker is out of context (lead_in A on side B or reverse marker on side B) this error occurs.
23	No TOC available A direct access search has been requested on a super-user tape which does not have a valid TOC. This search requests can not be honoured.
24	Sector not allowed Not allowed to change sector in this mode or a sector is requested which is not on the tape, e.g. sector D on a 2-sector tape.
26	Clean head The reproduction of the audio is bad due to dirt on the head. The user should clean it.
30	Tape broken
31	Tape drive power down This message indicates that the tape drive module has detected a power failure condition.

BLOCKDIAGRAM

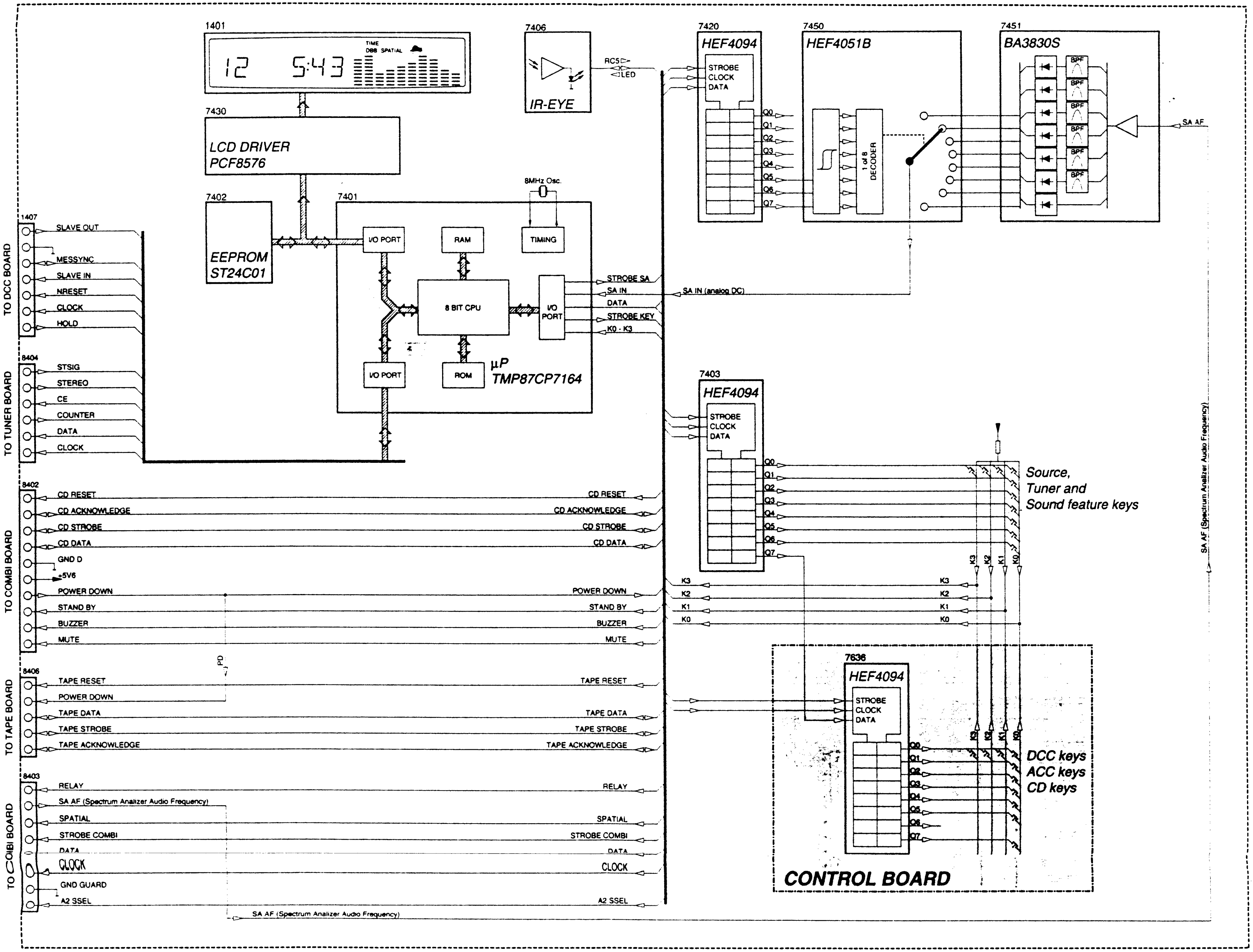

COMBI Board
For details see separate Functional Diagram (Chapter 6-1)
DCC REC
680E
1.5V
(DCC, 0dB 1kHz)
SOURCE SELECT
BUFFER
110mV
(77mV for 27W)
LOGIC
2x HEF4052
DSC &
SPATIAL
210mV
DBB
MOTORISED VOL
MUTE
185mV
POWER AMP
STK4132
RELAY
MUTE
HEADPHONE
32 Ω
6 Ω
27W
(12.7V at 6Ω and 27W)
DAC out
185mV
(0dB CD)
Zi=2k2
DCC
For details see separate Functional Diagram (Chapter 10-10)
ACC out
'DOMS'
ACC REC
1k
230mV
(0dB CD)
ALC-Level: 90mV
Zi=22k
TAPE
For details see separate Functional Diagram (Chapter 9-1)
460mV
(200nWb/m)
180mV
(ACC 200nVs/m)
DSC
DBB
VOL UP/DWN
MODE SEL
SHIFT
REGISTER
CD
Za=2k
For details see separate Functional Diagram (Chapter 10-2)
490mV
(CD 0dB, 1kHz)
AUX
150mV
500mV
1,5V
TUNER
150mV+/-3dB
(dev.67.5kHz)
TAPE
CD
TUNER
µP
87CP71
SPATIAL
MUTE
BUZZER
RELAY
DCC ON
STDBY
PD
IR - EYE
LC
DISPLAY
KEY
CONTROL
RC
INDICATOR
FRONT Board
For details see separate Functional Diagram (Chapter 6-1)
+VCC
-VCC
-5A
TRANSFORMER
AC
MAINS
TRAFO / SUPPLY
+5A
+10S
+M
+B
REG
POWER
DOWN
+5D
REG
+VCD
+D
REG

WIRING DIAGRAM


TUNER 92
JST 4p h m 2.5 XH
1117
JST 6p h m 2.5 XH
1112
3 turns
Thoroid
5001
1 turn
8402 CWAS 10XH/10OP 140 6+4 BK 24F
8403 CWAS 08XH/08OP 180 2+6 BK 24F
8026 CWAS 06XH/06XH 220 6BK 26S
8406 CON ASSY 5w 220mm AWG24
9024 CWAS 03XH/03XH 220 3p BK 26S
8460 CON ASSY 2w 220mm AWG28 grey black
1558
JST 8p v m 2.5 XH
1559
JST 10p v m 2.5 XH
1580
1552
8014 CON ASSY 4w 400mm AWG 26
1564
JST 4p m v 2.5 XH
1591
JST 3p v m 2.5 XH
JST 3p v m 2.0 PH
1590
1560
JST 6p v m 2.5 XH
8015 CON ASSY 2w 220mm AWG26
rotary knob
black
grey
1
2
JST 2.5XH
6000
K
A
1557
JST 7p m v 2.5 XH
1561
JST 2p m v 2.5 XH
1568
JST 2p m v 2.5 XH
COMBI BOARD
8023 CWAS 02PH/02OP 220mm grey/black 28S
1550
1570
JST 10p v m 2.0 PH
1569
JST 5p m v 2.0 PH
1571
JST 2p m v 2.0 PH
1304
1253
1567
JST 2p m v 2.5 XH
9
8
7
6
5
4
3
2
1
JST 8p m v 2.5 XH
KOIDE
PD054-02HG
DCC BACKLIGHTING
17
LAMP PCB
CON 2p v dip-mate
8010 CWAS 07XH/07XH 480 4+3S BK 26S
8022 CWAS 10PH/10PH 400 5+5 BK 26S
8020 CWAS 05PH/05PH 340 5P BK 26S
8011 CWAS 02XH/02HX 560 2p BK 26S
8017 CWAS 09XH/09XH 220 5+4 BK 24S
1470
JST 6p v m 2.5 XH
52
CON 8p v dip-mate
50
CON 5p v dip-mate
1407
JST 7p v m 2.0 PH
TAPE
FRONT
BACK
CD
TUNER
SHUFFLE
REPEAT 1
PAUSE
OVERLOAD
RECORD
DOLBY B
CHROME
1
2
TIMER
NEWS
DBB
SPATIAL
DCC
FRONT
BACK
AUTO
PROGRAM
EDIT
STEREO
FM
MW
LW
SW
AM
PM
CON vert dip mate 10p
KOIDE
PD054-02HG
FRONT
1
49
MOLEX 4455 5p
MOLEX 4455 4p
1405
1409
2.54mm 5p M50
1569
1570
2.54mm 4p M50
8482 CON ASSY 3w 560mm
8484 CON ASSY 8w 400mm JC25
19 CON v dip-mate 8p
18 CON v dip-mate 3p
1
KOIDE PD054-03HG
1482
1484
KOIDE PD054-08HG
KEY PBAS
9013 CWAS 06XH/06XH 280 6p BK 26S
JST 3p v m 2.5 XH
DCC(ACC) input
Analog interface
1712
JST 6p v m 2.5 XH
ETF3 single Dolby_B DCC
1704
controller I/O
1709
JST 5p m v 2.5 XH
Digital Supply
JST 2p m v 2.5 XH
1711
Tokyo Pigeon Logic Drive
8025 CWAS 03PH/03PH 220 3p BK 26S
8012 CWAS 02XH/02XH 280 2p BK 26S
1601
JST 5p v m 2.0 PH
Power interface
JST 10p v m 2.0 PH
1604
JST 3p v m 2.0 PH
DAISY 1 BASIC FLAP
digital board
analog I/O
controller I/O
JST 7p v m 2.0 PH
1606
1605
ALPS DCC Drive Mechanism
8021 CWAS 07PH/07PH 280 4+3 BK 26S
1581
JST 9p m v 2.5 XH
TRAFO PCB
Mains Cord
N
L1
CD-SL
1805
JST 2p m h 2.5 XH
1804
JST 7p m h 2.5 XH
male
3
2
1
female
dipmate
JST 2.0 (PH) or 2.5 (XH)
except otherwise indicated

CS 52 042

FUNCTIONAL DIAGRAM Front Board + Control Board


1401
12 5:43
TIME
DBB SPATIAL
7430
LCD DRIVER
PCF8576
7402
EEPROM
ST24C01
7401
I/O PORT
RAM
TIMING
8MHz Osc.
8 BIT CPU
I/O PORT
I/O PORT
ROM
µP
TMP87CP7164
7406
IR-EYE
RC5
LED
7420
HEF4094
STROBE
CLOCK
DATA
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
7450
HEF4051B
1 of 8 DECODER
7451
BA3830S
BPF
SA AF
STROBE SA
SA IN
DATA
STROBE KEY
K0 - K3
SA IN (analog DC)
1407
TO DCC BOARD
SLAVE OUT
MESSYNC
SLAVE IN
NRESET
CLOCK
HOLD
8404
TO TUNER BOARD
STSIG
STEREO
CE
COUNTER
DATA
CLOCK
8402
TO COMBI BOARD
CD RESET
CD ACKNOWLEDGE
CD STROBE
CD DATA
GND D
+5V6
POWER DOWN
STAND BY
BUZZER
MUTE
PD
8406
TO TAPE BOARD
TAPE RESET
POWER DOWN
TAPE DATA
TAPE STROBE
TAPE ACKNOWLEDGE
8403
TO COMBI BOARD
RELAY
SA AF (Spectrum Analizer Audio Frequency)
SPATIAL
STROBE COMBI
DATA
CLOCK
GND GUARD
A2 SSEL
SA AF (Spectrum Analizer Audio Frequency)
7403
HEF4094
STROBE
CLOCK
DATA
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
K3
K2
K1
K0
Source,
Tuner and
Sound feature keys
7636
HEF4094
STROBE
CLOCK
DATA
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
K3
K2
K1
K0
DCC keys
ACC keys
CD keys
CONTROL BOARD

Functional Description Front Board, Control Board

Principle Function Key recognition: (see Fig.1)

By means of 2 shift registers HEF4094 (7403, 7636) the status of the key lines will be detected. Via these port expanders the number of input lines on the µP will be reduced. In the FW68 only four lines (K0 - K3) are needed for this task. For better understanding this port expander will be explained via the functioning of only one shift register.

1) The µP sends continuously an eight bit word - 7xHigh 1xLow = 11111110 (respectively a sixteen bit word for two shift registers - 15xHigh 1xLow). This low is derived from an internal counter. With the first clock pulse this low is shifted from data into Q0. Each clock pulse shifts this Low to Q1, Q2, Q3 ... The µP increases the internal counter with each clock pulse simultaneously.

2) After each clock pulse the line K0 will be checked by the µP. If this line is detected High, the µP knows that no button is depressed. If the line is detected Low, the µP knows that one button has been depressed.

3) With this information and the stage of the internal counter the µP recognizes which button has been depressed.

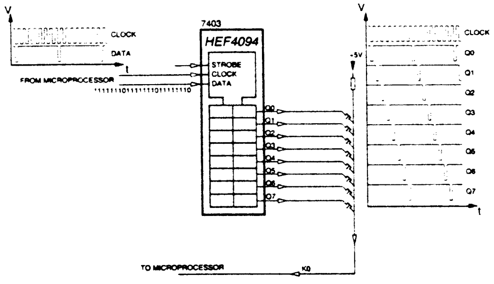


Fig. 1

Principle Functioning of Spectrum Analyzer:

The information for the spectrum analyzer is created on the Front Board. Via the Combi Board (connector 8403 / pin 2) arrives the signal SA AF (Spectrum Analyzer Audio Frequency) at IC 7451. The SA AF-signal is a summary of the audio channels, left and the right.
In IC 7451 the sum signal has been devided into six frequency bands (used are only five of them) and each band signal has been rectified. This means DC output voltages from the IC, which are proportional to the amplitude of the corresponding bandwidth-channel.
The µP addresses the multiplexer (7450) via shift register 7420. In this way each bandwidth-channel information will be connected to an internal A/D Converter in the µP. The digital output is forwarded to and shown on the Display.

Display:

The used µP has an internal LCD driver too, but this one is not used. The display will be controlled by an own LCD driver (7430) via the I²C Bus. Via the same I²C Bus the preset frequencies and the status of the set will be stored in the EEPROM (7402), when power is switched off.

Remote Control:

In case the infrared eye detects a signal, it will be sent to the µP. Only when the µP recognizes an RC5 Code a rectangular signal will be sent back to the IR-EYE unit. Via transistor 7460 the LED on the volume potentiometer starts blinking.

Funktionsbeschreibung Front Board, Control Board

Funktionsprinzip Tasten abfrage: (Siehe Fig.1)

Über zwei Schieberegister (7403, 7636) werden die Tasten abgefragt. Durch diese Port Expander werden Input-Leitungen am µP gespart. Beim FW68 übernehmen nur vier Leitungen (K0-K3) die Abfrage sämtlicher Tasten.
Zum einfacheren Verständnis wird der Port Expander hier nur an Hand eines Schieberegisters erklärt.

1) Der µP sendet ein 8-Bit Wort - 7x High, 1x Low (11111110), beziehungsweise ein 16 Bit Wort (15x High, 1x Low) bei zwei Schieberegister. Dieses Low ist von einem internen Zähler abgeleitet. Beim ersten Clockimpuls liegt dieses Low am Ausgang Q0. Mit jedem weiteren Clockimpuls wird dieses Low zu Q1, Q2, Q3,... weitergeschaltet. Gleichzeitig wird intern mitgezählt.

2) Nach jedem Clockimpuls wird die Leitung K0 abgefragt. Ist die Leitung K0 High, so erkennt der µP, daß keine Taste gedrückt ist. Wenn die Leitung K0 Low ist, so erkennt der µP, daß eine Taste gedrückt ist.

3) Aus dieser Information und seinem internen Zählerstand erkennt der µP welche Taste gedrückt ist.

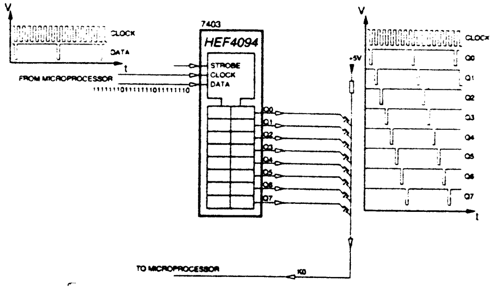


Fig. 1

Funktionsprinzip Spectrum Analizer:

Am Front Board wird auch die Information für den Spectrum Analizer gewonnen. Vom Combi Board (Connector 8403/pin2) kommt das Summensignal aus Audio links und rechts.
Der IC7451 teilt dieses Signal mittels interner Bandpässe in sechs Frequenzbereiche (von denen allerdings nur fünf verwendet werden) auf und richtet die Audioinformation gleich. Das heißt, an den Ausgängen des ICs liegt eine Gleichspannung, die proportional der Amplitude des betreffenden Kanals ist.
Der µP stellt über das Schieberegister 7420 die Adresse für den Multiplexer (7450) ein. So wird ein Kanal nach dem anderen abgefragt und einem A/D Konverter im µP zugeführt.

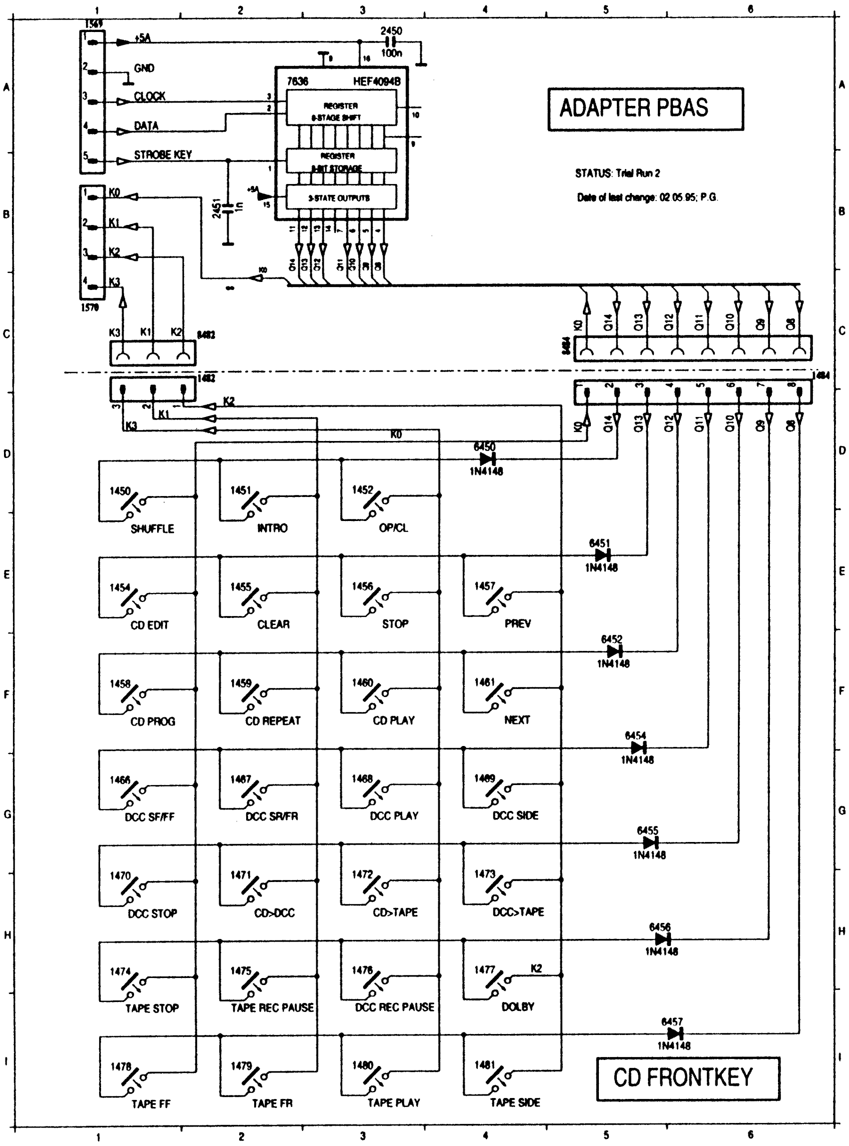
Display:

Der µP hat intern auch einen LCD Treiber. Dieser wird jedoch nicht verwendet. Das Display wird von einem eigenen LCD Treiber (7430) über I²C- Bus gesteuert.
Über diesen I²C-Bus wird auch das EEPROM (7402), welches die Information über Preset Frequenzen und den Status des Geräts beinhaltet, angesteuert.

Remote Control:

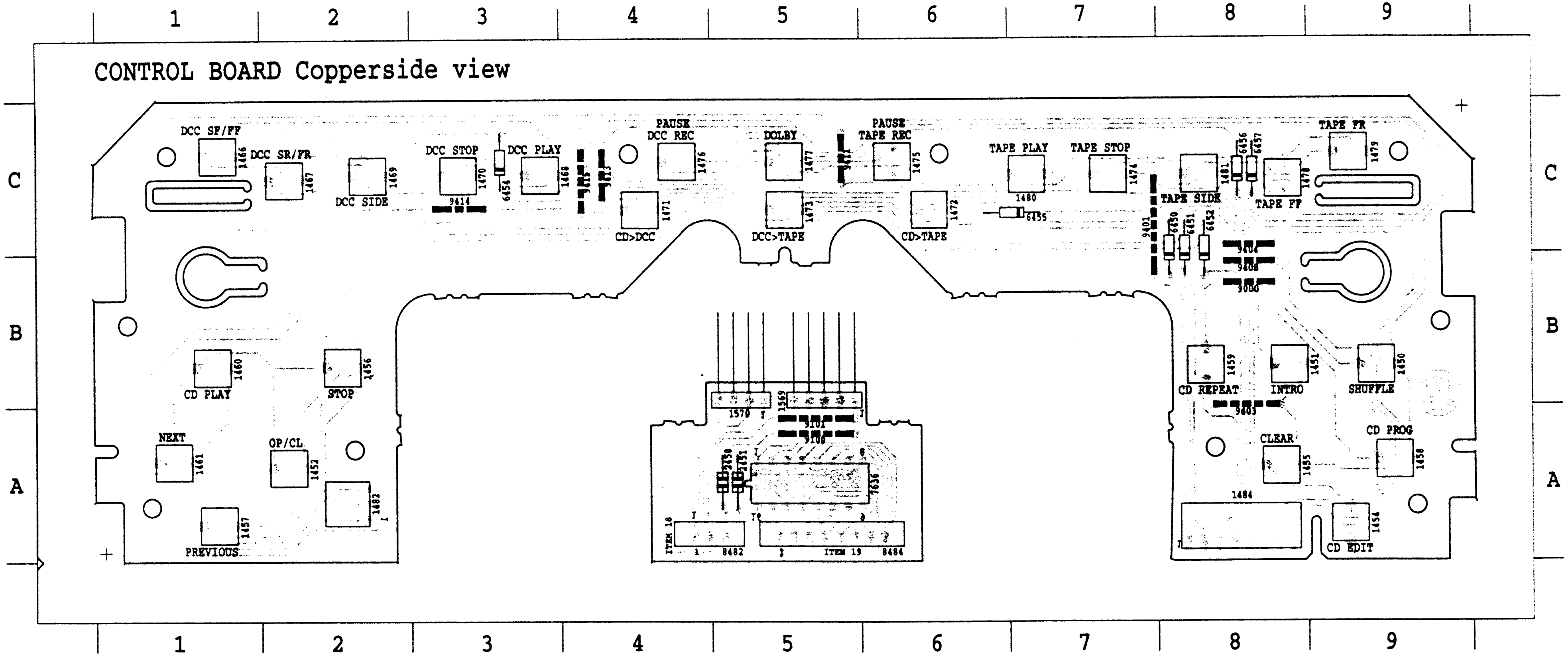
Erkennt das Infrarot Auge 7406 ein Signal, so wird dieses an den µP geschickt. Erkennt der µP einen RC5 Code, sendet er ein Rechtecksignal zurück. Dieses bringt über Transistor 7460 die Leuchtdiode am Lautstärkepotentiometer zum blinken.

1450	D 1
1451	D 2
1452	D 3
1454	E 1
1455	E 2
1456	E 3
1457	E 4
1458	F 1
1459	F 2
1460	F 3
1461	F 4
1466	G 1
1467	G 2
1468	G 3
1469	G 4
1470	H 1
1471	H 2
1472	H 3
1473	H 4
1474	H 1
1475	H 2
1476	H 3
1477	H 4
1478	I 1
1479	I 2
1480	I 3
1481	I 4
1482	D 1
1484	F 6
1569	A 1
1570	C 1
2450	A 3
2451	B 2
6450	D 4
6451	E 5
6452	F 5
6454	F 5
6455	G 5
6456	H 5
6457	I 6
7636	A 2
8482	C 1
8484	C 2


ADAPTER PBAS
STATUS: Trial Run 2
Date of last change: 02.05.95; P.G.
CD FRONTKEY
1569
+5A
GND
CLOCK
DATA
STROBE KEY
2450
100n
7636
HEF4094B
REGISTER
8-STAGE SHIFT
REGISTER
8-BIT STORAGE
3-STATE OUTPUTS
2451
1n
K0
K1
K2
K3
1570
8482
1482
8484
1484
Q14
Q13
Q12
Q11
Q10
Q9
Q8
6450
6451
6452
6454
6455
6456
6457
1N4148
1450
SHUFFLE
1451
INTRO
1452
OP/CL
1454
CD EDIT
1455
CLEAR
1456
STOP
1457
PREV
1458
CD PROG
1459
CD REPEAT
1460
CD PLAY
1461
NEXT
1466
DCC SF/FF
1467
DCC SR/FR
1468
DCC PLAY
1469
DCC SIDE
1470
DCC STOP
1471
CD>DCC
1472
CD>TAPE
1473
DCC>TAPE
1474
TAPE STOP
1475
TAPE REC PAUSE
1476
DCC REC PAUSE
1477
DOLBY
1478
TAPE FF
1479
TAPE FR
1480
TAPE PLAY
1481
TAPE SIDE
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6

1452	A	2
1451	B	8
1450	B	9
1456	B	2
1455	A	8
1454	A	9
1459	B	8
1458	A	9
1457	A	1
1466	C	1
1461	A	1
1460	B	1
1469	C	2
1468	C	3
1467	C	2
1472	C	6
1471	C	4
1470	C	3
1475	C	6
1474	C	7
1473	C	5
1478	C	8
1477	C	5
1476	C	4
1481	C	8
1480	C	7
1479	C	9
1569	B	5
1484	A	8
1482	A	2
2451	A	5
2450	A	5
1570	B	5
6452	C	8
6451	C	8
6450	C	8
6456	C	8
6455	C	7
6454	C	3
8482	A	4
7636	A	5
6457	C	8
9100	A	5
9000	B	8
8484	A	5
9403	B	8
9401	C	7
9101	A	5
9411	C	5
9408	B	8
9404	C	8
9415	C	4
9414	C	3
9413	C	4

CONTROL BOARD Copperside view



1
2
3
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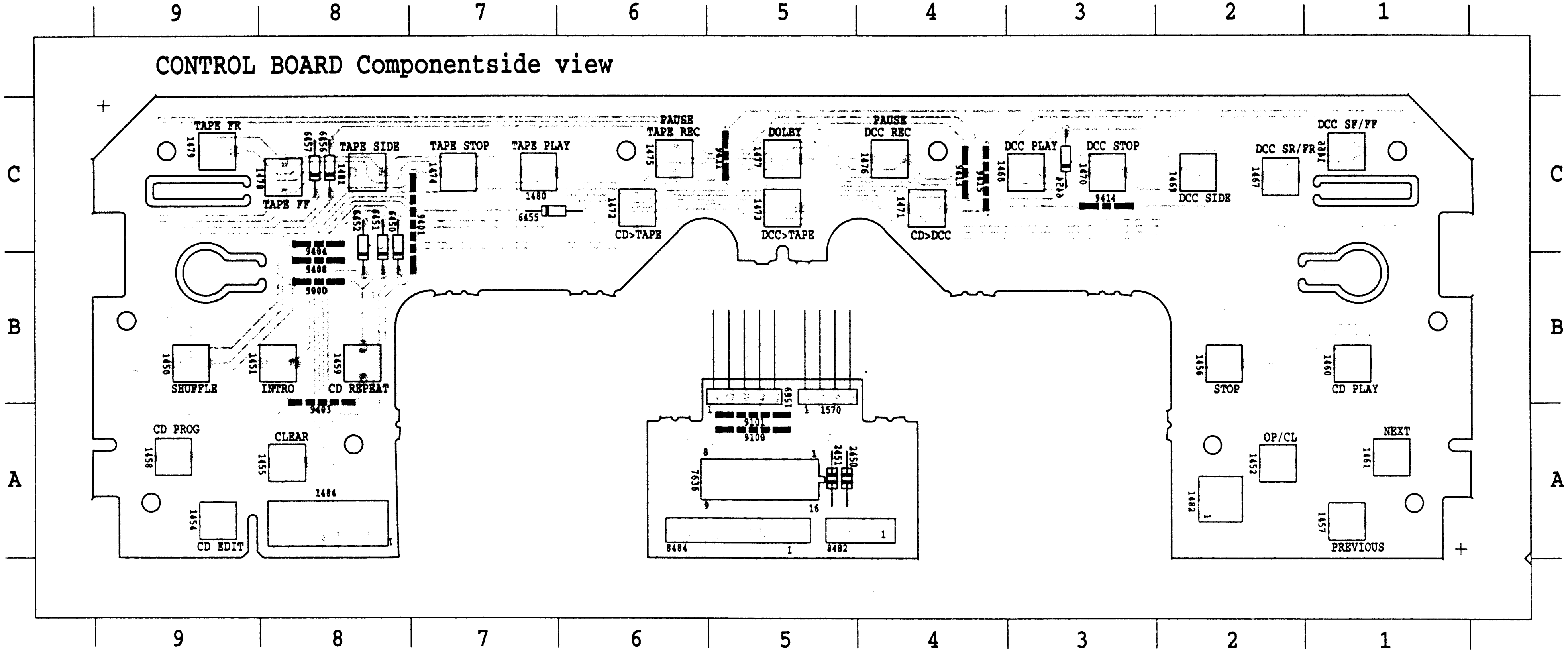
9
C
B
A
DCC SF/FF
1466
DCC SR/FR
1467
DCC SIDE
1469
DCC STOP
1470
9414
6454
DCC PLAY
1468
9415
9413
PAUSE
DCC REC
1476
CD>DCC
1471
DOLBY
1477
DCC>TAPE
1473
9411
PAUSE
TAPE REC
1475
CD>TAPE
1472
TAPE PLAY
1480
6455
TAPE STOP
1474
9401
TAPE SIDE
1481
6456
6457
TAPE FF
1478
TAPE FR
1479
6450
6451
6452
9404
9408
9000
CD PLAY
1460
STOP
1456
NEXT
1461
OP/CL
1452
1482
PREVIOUS
1457
1570
1569
9101
9100
2450
2451
7636
ITEM 18
8482
ITEM 19
8484
CD REPEAT
1459
INTRO
1451
SHUFFLE
1450
9403
CLEAR
1455
CD PROG
1458
1484
CD EDIT
1454

1452 A 2	1456 B 2	1459 B 8	1466 C 1	1469 C 2	1472 C 6	1475 C 6	1478 C 8	1481 C 8	1569 B 5	2451 A 5	6452 C 8	6456 C 8	8482 A 4	9100 A 5	9403 B 8	9411 C 5	9415 C 4
1451 B 8	1455 A 8	1458 A 9	1461 A 1	1468 C 3	1471 C 4	1474 C 7	1477 C 5	1480 C 7	1484 A 8	2450 A 5	6451 C 8	6455 C 7	7636 A 5	9000 B 8	9401 C 7	9408 B 8	9414 C 3
1450 B 9	1454 A 9	1457 A 1	1460 B 1	1467 C 2	1470 C 3	1473 C 5	1476 C 4	1479 C 9	1482 A 2	1570 B 5	6450 C 8	6454 C 3	6457 C 8	8484 A 5	9101 A 5	9404 C 8	9413 C 4

CONTROL BOARD Componentside view



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C
B
A
TAPE FR
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1478
TAPE FF
6457
6456
1481
TAPE SIDE
TAPE STOP
1474
TAPE PLAY
1480
6455
9401
6452
6451
6450
9404
9408
9000
PAUSE
TAPE REC
1475
1472
CD>TAPE
9411
DOLBY
1477
1473
DCC>TAPE
PAUSE
DCC REC
1476
1471
CD>DCC
9413
9415
1468
DCC PLAY
6454
DCC STOP
1470
9414
1469
DCC SIDE
DCC SR/FR
1467
DCC SF/FF
1466
1450
SHUFFLE
1451
INTRO
1459
CD REPEAT
9403
CD PROG
1458
CLEAR
1455
1484
1454
CD EDIT
1569
1570
9101
9100
7636
2451
2450
8484
8482
1456
STOP
1460
CD PLAY
OP/CL
1452
NEXT
1461
1482
1457
PREVIOUS

1401	C	5
1405	E	4
1407	A	7
1409	E	3
1410	E	2
1411	D	6
1412	B	9
1413	B	8
1414	E	1
1415	D	7
1416	B	9
1417	B	8
1418	B	2
1419	B	1
1420	E	1
1421	D	1
1422	A	2
1423	A	2
1424	A	1
1425	B	1
1426	D	2
1428	A	9
1429	A	8
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2470	C	6
2471	D	5
3424	C	8
3431	A	6
3434	A	7
3437	A	6
3439	B	6
3446	A	5
3447	A	5
3448	A	6
3449	A	6
3452	A	6
3453	B	6
3454	A	4
3455	A	6
3457	A	4
3459	B	7
3461	D	7
3464	B	6
3475	A	6
3493	B	6
3514	B	6
5401	A	6
5402	A	5
5404	B	6
5416	C	3
5418	A	3
5430	A	3
6401	B	7
6402	A	7
6410	C	1
6411	C	1
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6416	D	2
6417	D	2
6419	D	1
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7406	E	7
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7451	D	5
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8403	A	6
8406	A	4
9500	E	5
9501	E	5
9503	D	5
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9578	B	9
9579	B	9
9580	A	9
9581	D	6
9582	C	1
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9585	A	3
9586	A	6
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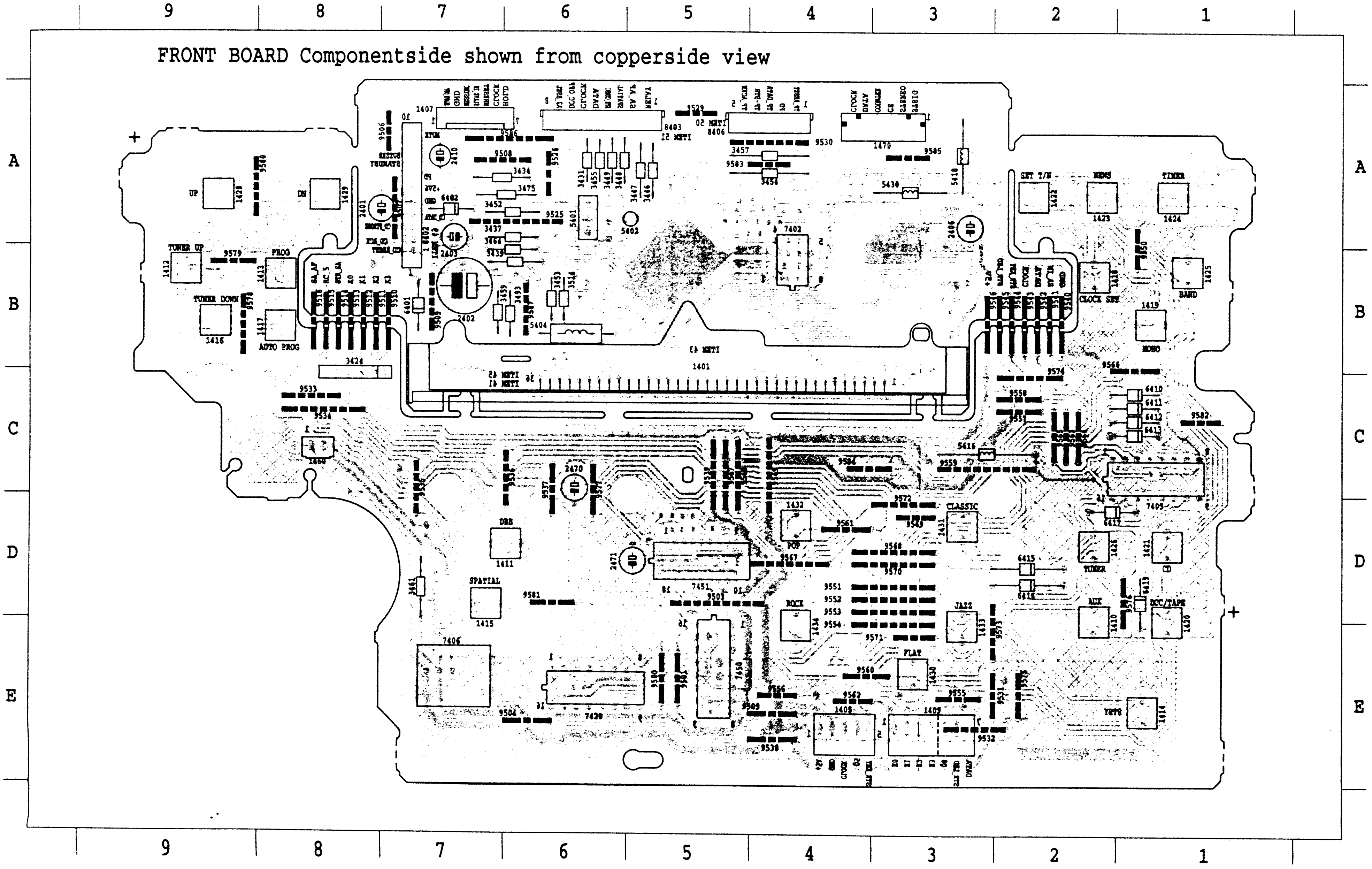
FRONT BOARD Componentside shown from copperside view



9
8
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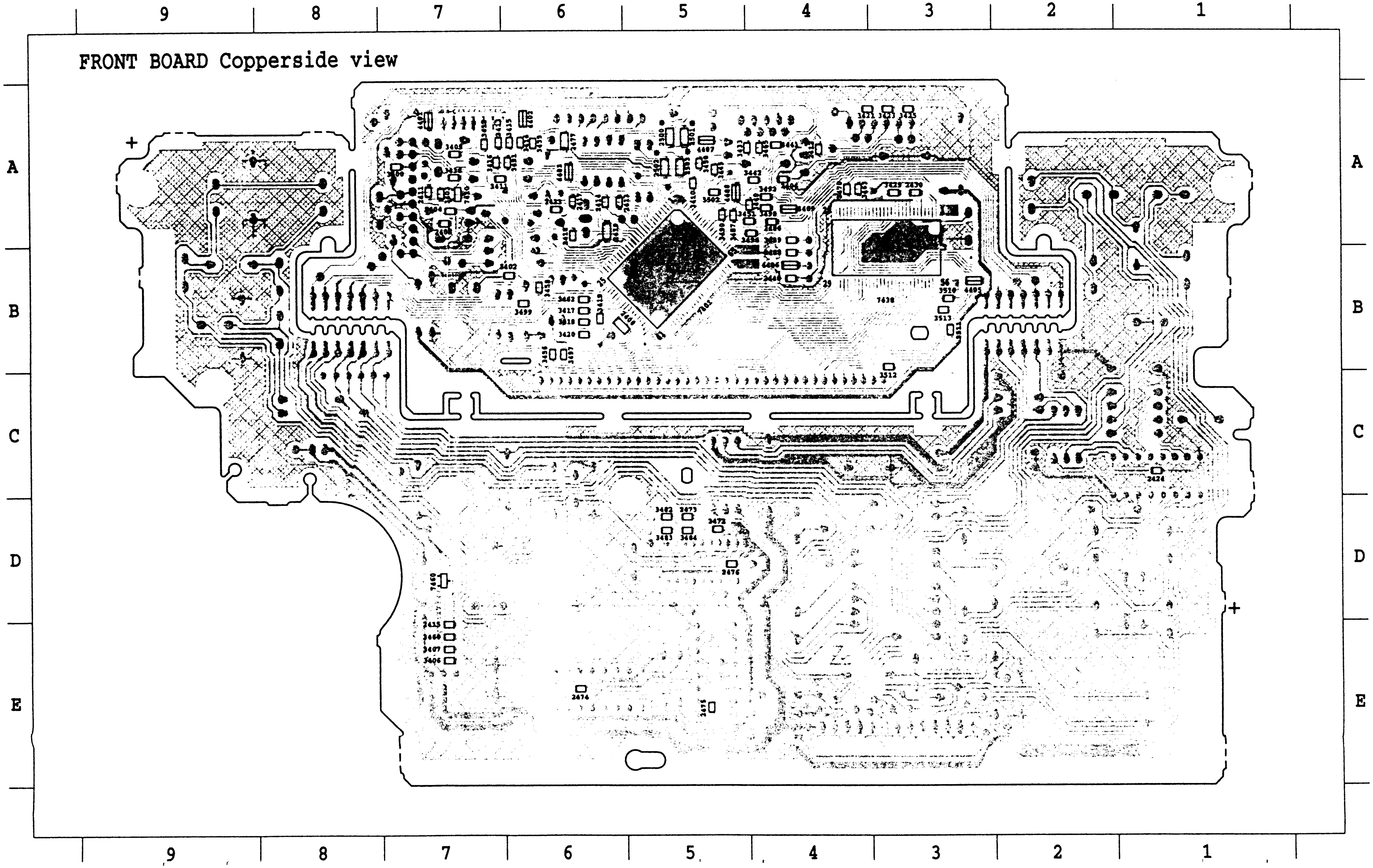
1
A
B
C
D
E
UP
DN
TUNER UP
PROG
TUNER DOWN
AUTO PROG
SET T/N
NEWS
TIMER
CLOCK SET
BAND
MONO
DBB
SPATIAL
POP
CLASSIC
ROCK
JAZZ
FLAT
TUNER
CD
AUX
DCC/TAPE
TAPE
1401
1407
1470
7402
7405
7406
7420
7450
7451

2400 B 6	2417 A 6	2473 D 5	2503 A 5	3411 A 7	3419 B 6	3436 A 7	3458 B 6	3484 D 5	3496 A 4	3512 B 3	4408 A 5	T003 B 7	T011 A 4	T019 A 6	T029 A 3	T037 A 5	T045 E 4	T053 E 2	T061 D 5
2404 A 4	2418 A 6	2474 E 6	3402 B 6	3412 A 7	3420 B 6	3440 A 4	3460 E 7	3486 A 4	3497 B 6	3513 B 3	4409 A 4	T004 A 7	T012 A 5	T020 B 2	T030 A 3	T038 A 6	T046 E 4	T054 E 3	T062 C 7
2405 A 7	2419 A 6	2475 E 5	3403 A 7	3413 A 7	3421 A 4	3441 A 4	3462 B 6	3487 A 5	3498 A 4	4401 A 7	7401 B 5	T005 A 7	T013 A 4	T021 B 2	T031 A 4	T039 B 6	T047 E 4	T055 D 5	T063 B 6
2411 A 7	2423 A 6	2476 D 5	3404 A 7	3414 A 6	3423 A 3	3442 A 4	3463 A 4	3488 B 4	3499 B 6	4402 A 6	7410 A 7	T006 A 7	T014 A 4	T023 B 7	T032 A 4	T040 A 6	T048 E 3	T056 D 5	
2412 A 4	2424 C 1	2477 A 6	3406 E 7	3415 A 6	3425 A 3	3445 A 5	3465 A 4	3489 A 4	3500 A 7	4403 A 6	7430 B 3	T007 A 8	T015 A 4	T024 C 8	T033 A 4	T041 A 5	T049 E 3	T057 E 5	
2413 A 6	2430 A 3	2500 A 5	3407 E 7	3416 A 7	3429 A 3	3450 A 5	3470 A 4	3490 A 5	3502 A 5	4405 B 3	7460 D 7	T008 A 6	T016 A 6	T025 D 7	T034 A 4	T042 B 6	T050 E 3	T058 E 5	
2414 A 6	2440 B 4	2501 A 5	3409 A 7	3417 B 6	3433 A 4	3451 A 4	3482 D 5	3491 A 6	3510 B 3	4406 B 4	T001 B 7	T009 A 7	T017 B 8	T026 A 7	T035 A 7	T043 E 4	T051 E 3	T059 E 5	
2415 E 7	2472 D 5	2502 A 5	3410 A 5	3418 B 6	3435 A 6	3456 B 6	3483 D 5	3492 A 4	3511 B 3	4407 A 5	T002 B 7	T010 A 7	T018 B 8	T027 A 7	T036 A 7	T044 E 4	T052 E 3	T060 D 5	

FRONT BOARD Copperside view


9
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4
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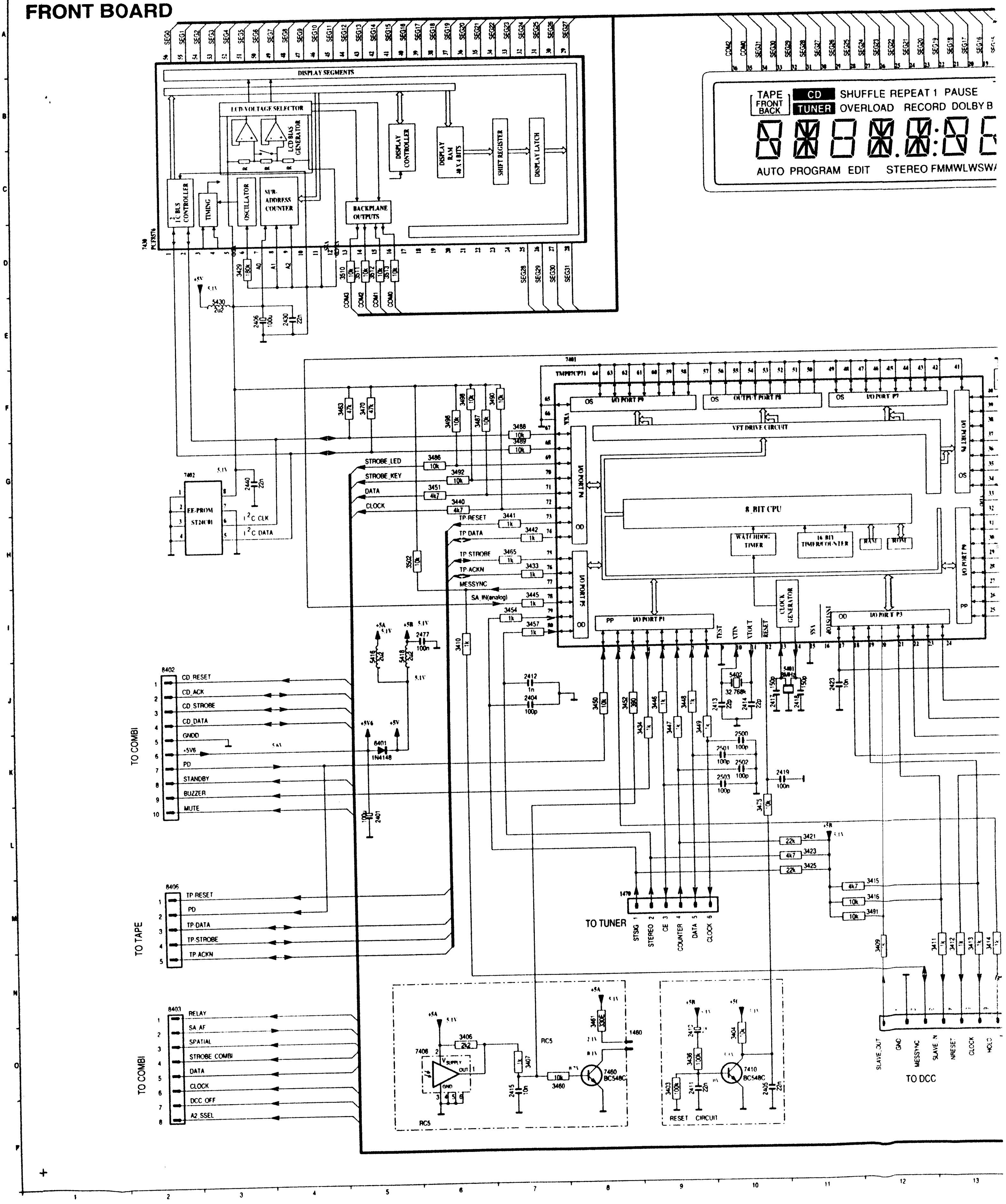
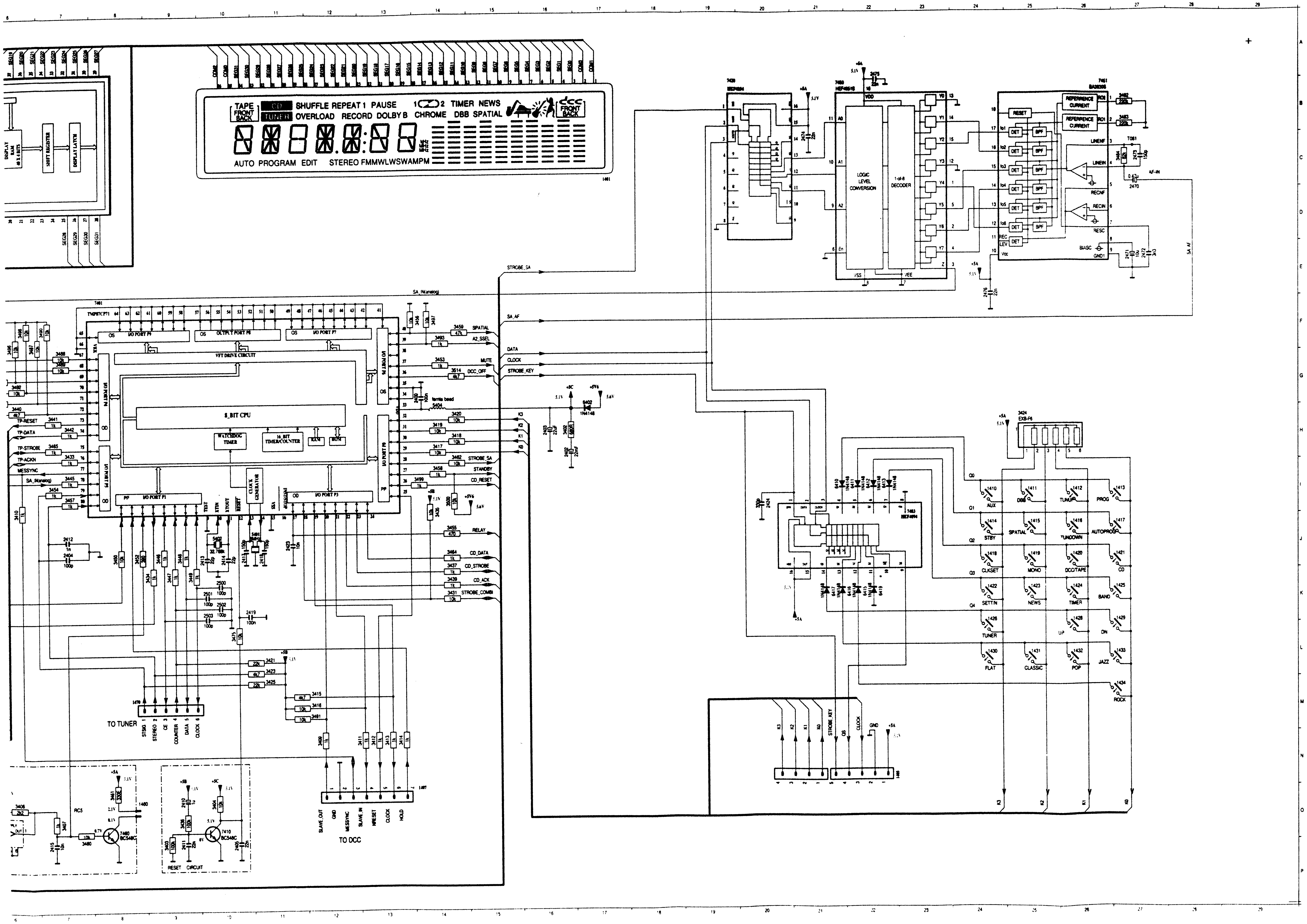
1
A
B
C
D
E
3421
3423
3425
3429
3430
3402
3499
3482
3417
3418
3420
7430
3520
4405
3513
3512
2424
3482
2473
3483
3484
3472
2476
7460
2415
3460
3407
3406
2474
2475
+
+

FRONT BOARD


DISPLAY SEGMENTS
LCD-VOLTAGE SELECTOR
LCD BIAS GENERATOR
DISPLAY CONTROLLER
DISPLAY RAM 40 X 4 BITS
SHIFT REGISTER
DISPLAY LATCH
I²C BUS CONTROLLER
TIMING
OSCILLATOR
SUB-ADDRESS COUNTER
BACKPLANE OUTPUTS
7430 PCF8576
TAPE FRONT BACK
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
OVERLOAD RECORD DOLBY B
AUTO PROGRAM EDIT STEREO FMMWLWSW
7401 TMP87CP71
I/O PORT P0
OUTPUT PORT P8
I/O PORT P7
VFT DRIVE CIRCUIT
I/O PORT P4
I/O PORT P6
8 BIT CPU
WATCHDOG TIMER
16 BIT TIMER/COUNTER
RAM
ROM
I/O PORT P5
I/O PORT P9
I/O PORT P1
CLOCK GENERATOR
I/O PORT P3
TEST
XTIN
XTOUT
RESET
7402 EE-PROM ST24C01
I²C CLK
I²C DATA
STROBE_LED
STROBE_KEY
DATA
CLOCK
TP RESET
TP DATA
TP STROBE
TP ACKN
MESSYNC
SA IN(analog)
8402
CD_RESET
CD_ACK
CD_STROBE
CD_DATA
GNDD
+5V6
PD
STANDBY
BUZZER
MUTE
TO COMBI
6401 1N4148
8405
TP RESET
PD
TP DATA
TP STROBE
TP ACKN
TO TAPE
8403
RELAY
SA_AF
SPATIAL
STROBE_COMBI
DATA
CLOCK
DCC_OFF
A2_SSEL
TO COMBI
1470
TO TUNER
STSIG 1
STEREO 2
CE 3
COUNTER 4
DATA 5
CLOCK 6
7408
RC5
7460 BC548C
1460
7410 BC548C
RESET CIRCUIT
5402 32.768k
5401 8MHz
SLAVE_OUT
GND
MESSYNC
SLAVE_IN
NRESET
CLOCK
HOLD
TO DCC


TAPE
FRONT
BACK
CD
TUNER
SHUFFLE REPEAT 1 PAUSE
OVERLOAD RECORD DOLBY B
1 2 TIMER NEWS
CHROME DBB SPATIAL
dcc
FRONT
BACK
AUTO PROGRAM EDIT STEREO FMMWLWSWAMPM
1401
DISPLAY RAM 48 X 8 BITS
SHIFT REGISTER
DISPLAY LATCH
7420
HEF4094
7450
HEF4051B
LOGIC LEVEL CONVERSION
1-of-8 DECODER
VDD
VSS
VEE
7451
BA3830S
RESET
REFERENCE CURRENT
DET
BPF
LINENF
LINEIN
RECNF
RECIN
RESC
BIASC
GND1
Vcc
T081
AF-IN
SA_AF
STROBE_SA
SA_IN(analog)
7401
TMP87CP71
I/O PORT P9
OUTPUT PORT P8
I/O PORT P7
VFT DRIVE CIRCUIT
8_BIT CPU
WATCHDOG TIMER
16_BIT TIMER/COUNTER
RAM
ROM
CLOCK GENERATOR
I/O PORT P1
I/O PORT P3
I/O PORT P4
I/O PORT P5
I/O PORT P6
TEST
XTIN
XTOUT
RESET
SPATIAL
A2_SSEL
MUTE
DCC_OFF
ferrite bead
STROBE_SA
STANDBY
CD_RESET
RELAY
CD_DATA
CD_STROBE
CD_ACK
STROBE_COMBI
DATA
CLOCK
STROBE_KEY
K3
K2
K1
K0
TP-RESET
TP-DATA
TP-STROBE
TP-ACKN
MESSYNC
SA_IN(analog)
32.768k
1N4148
3424
EXB-F6
7403
HEF4094
AUX
DBB
TUNUP
PROG
STBY
SPATIAL
TUNDOWN
AUTOPROG
CLKSET
MONO
DCC/TAPE
CD
SETT/N
NEWS
TIMER
BAND
TUNER
UP
DN
FLAT
CLASSIC
POP
JAZZ
ROCK
STROBE_KEY
GND
TO TUNER
STRG
STEREO
CE
COUNTER
DATA
CLOCK
1470
TO DCC
SLAVE_OUT
GND
MESSYNC
SLAVE_IN
NRESET
CLOCK
HOLD
1407
1460
RC5
7460
BC548C
7410
BC548C
RESET CIRCUIT
+5A
+5B
+5C
+5V6

1401	C17
1405	N23
1407	O13
1408	N19
1410	I24
1411	I25
1412	I26
1413	I27
1414	J24
1415	J25
1416	J26
1417	J27
1418	J24
1419	J25
1420	J26
1421	J27
1422	K24
1423	K25
1424	K26
1425	K27
1426	K24
1428	K26
1429	K27
1430	L24
1431	L25
1432	L26
1433	L27
1434	M27
1460	O 8
1470	M 9
2400	G14
2401	L 5
2402	H16
2403	H16
2404	J 7
2405	O10
2406	E 3
2410	O 9
2411	O 9
2412	J 7
2413	J10
2414	J10
2415	O 7
2417	K10
2418	K11
2419	K10
2423	J11
2424	I20
2430	E 4
2440	G 3
2470	C27
2471	E27
2472	E27
2473	C27
2474	C21
2475	A22
2476	E24
2477	I 6
2500	K10
2501	K10
2502	K10
2503	K10
3402	H16
3403	O 9
3404	O10
3406	O 6
3407	O 7
3409	N12
3410	I 6
3411	N12
3412	N13
3413	N13
3414	N13
3415	L14
3416	M14
3417	H14
3418	H14
3419	H14
3420	H14
3421	L11
3423	L11
3424	H25
3425	L11
3429	D 3
3431	K14
3433	H 7
3434	K 9
3435	I14
3436	O 9
3437	J14
3439	K14
3440	G 6
3441	H 7
3442	H 7
3445	I 7
3446	J 9
3447	K 9
3448	J 9
3449	K 9
3450	J 8
3451	G 6
3452	J 8
3453	G14
3454	I 7
3455	J14
3456	F14
3457	I 7
3458	I14
3459	F14
3460	O 7
3461	O 8
3462	H14
3463	F 5
3464	J14
3465	H 7
3470	F 5
3475	L10
3482	B27
3483	B27
3484	C27
3486	G 6
3487	F 6
3488	F 7
3489	G 7
3490	F 7
3491	L14
3492	G 6
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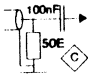
3496	F 6
3497	F14
3498	F 6
3499	I14
3500	I14
3502	H 5
3510	D 5
3511	D 5
3512	D 5
3513	D 5
3514	G14
5401	J11
5402	J10
5404	G14
5416	I 5
5418	I 5
5430	E 3
6401	K 5
6402	G17
6410	I21
6411	I22
6412	I22
6413	I22
6415	K22
6416	K22
6417	K21
6419	K22
7401	E 8
7402	G 2
7403	I23
7406	O 5
7410	O10
7420	B19
7430	D 2
7450	B21
7451	B26
7460	O 6
8402	J 2
8403	N 2
8406	M 2
9531	M20
9532	N19
9538	M20

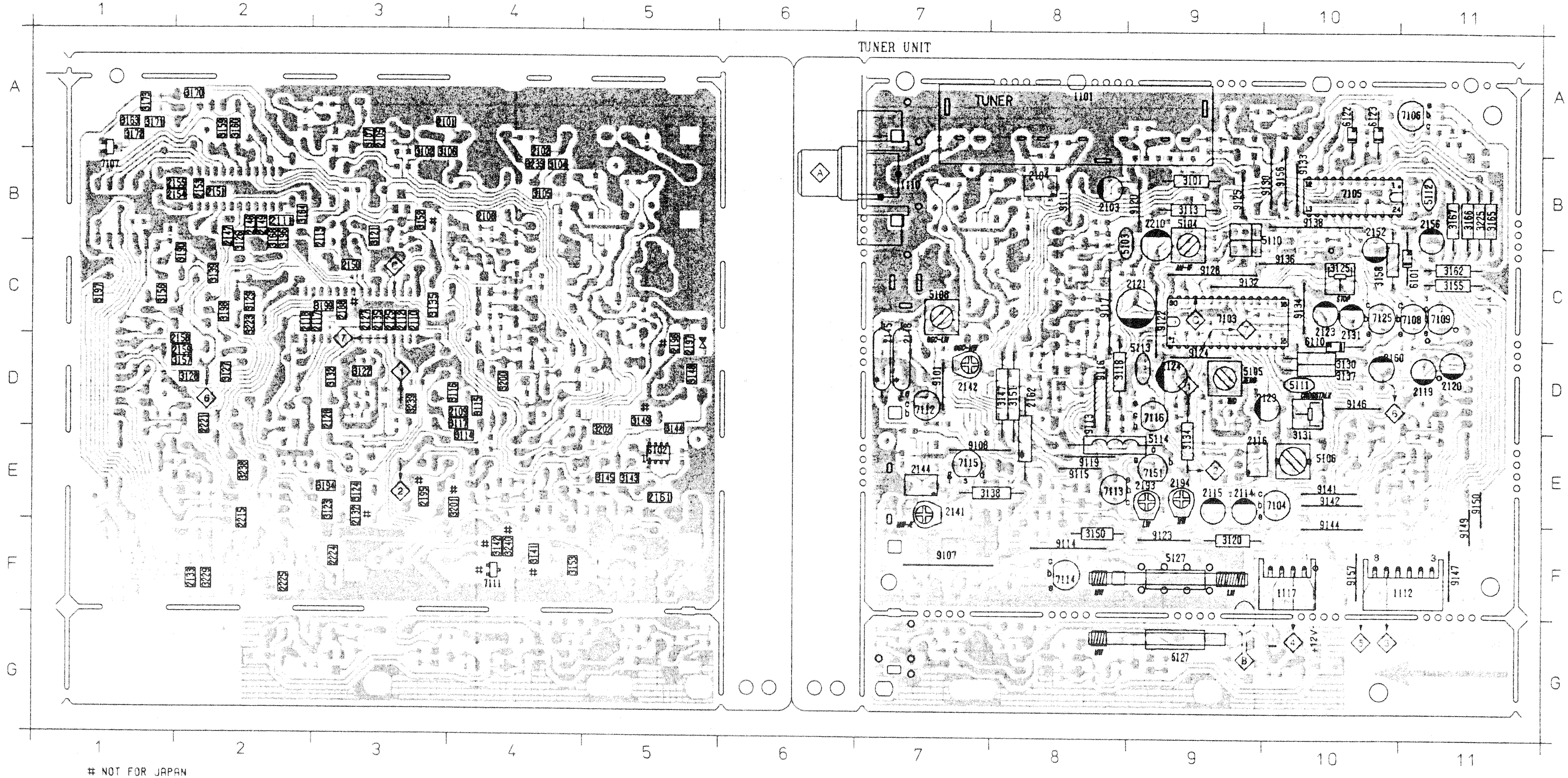
TUNER Adjustment Table (FM,MW,LW with Ferroceptor)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50)			108 MHz	check	6	7.....9V
			87.5MHz	check		1.3.....2V
LW 153 - 279kHz (3)			279kHz	5108		8.5V ± 0.1V
			153kHz	check		0.7.... 1.5V
MW 522 - 1611kHz (9)			1611kHz	2142		8,5V ± 0.1V
			522kHz	check		0.7.....1.7V
FM IF						
FM	98 MHz 1mV mod = 1kHz Δf = 75kHz	A	98MHz	5105	1 2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz 1mV 90% L + 9% pilot	A	98MHz	check	3	low < 1V
				3131	4	Right channel min.
SEARCH SENSITIVITY						
FM	98 MHz 12μV mod = 1kHz Δf = 75kHz	A	98MHz Sensitivity low "Level"	3125	5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz low as posible swept signal		1494kHz	5104	7	symmetrical and max height
AM - RF						
LW	155kHz mod = 1kHz 30 % AM 270kHz	B *	155kHz	5127 LW	7	MAX ↕
			270kHz	2193		
MW	558kHz mod = 1kHz 30 % AM 1494kHz		558kHz	5127 MW		MAX ↕
			1494kHz	2194		

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

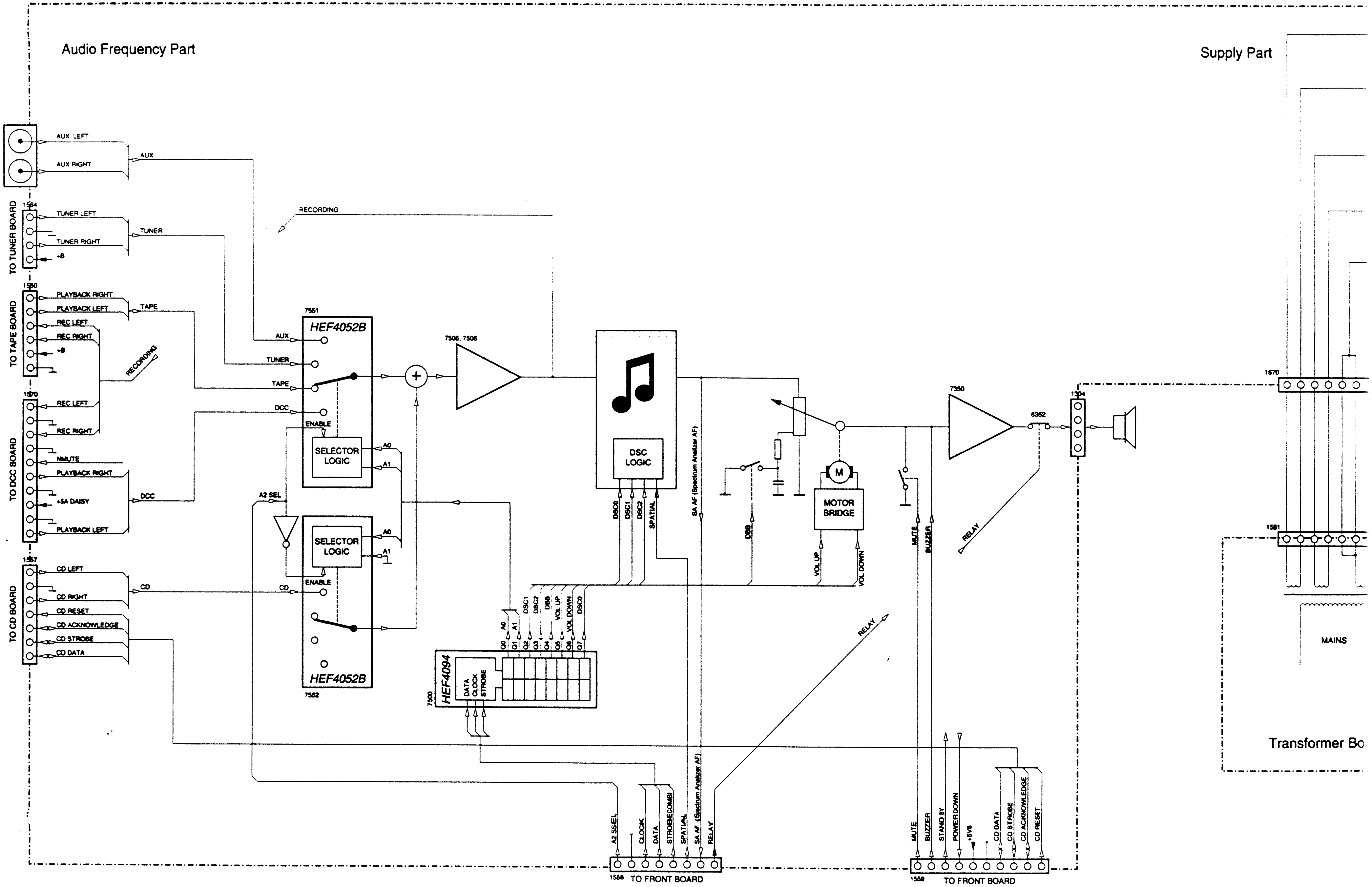
1101	A8	2115	E9	2135	C3	2158	D2	3101	B9	3124	E3	3143	E5	3162	C11	3199	C3	5110	B10	7108	C11	9115	E8	9141	E10
1110	B7	2116	E9	2141	E7	2159	D2	3102	B3	3125	C10	3144	E5	3163	A1	3200	D4	5111	D10	7109	C11	9116	D8	9142	E10
1112	F11	2117	C3	2142	D7	2160	D10	3104	B4	3126	C2	3145	E5	3164	B2	3201	E4	5112	B11	7111	F4	9117	C8	9144	F10
1117	F10	2118	C2	2144	E7	2161	E5	3105	B4	3127	D2	3147	D8	3165	B11	3202	E5	5113	D9	7112	D7	9119	E8	9146	D10
2101	A3	2119	D11	2145	C7	2162	D8	3106	B4	3128	D2	3148	D5	3166	B11	3223	C2	5114	E9	7113	E8	9120	B9	9147	F11
2102	B4	2120	D11	2146	C7	2188	C3	3107	A3	3129	C2	3149	D5	3167	B11	3225	B11	5127	F9	7114	F8	9122	C9	9149	E11
2103	B8	2121	C9	2147	B2	2193	E9	3113	B9	3130	D10	3150	F8	3168	B2	3229	F2	6101	C11	7115	E7	9123	F9	9150	E11
2104	B8	2123	C10	2148	B2	2194	E9	3114	E4	3131	E10	3151	D8	3170	A2	3233	B4	6102	E5	7116	D9	9124	D9	9156	B10
2105	A3	2124	D9	2149	B2	2195	E3	3115	D4	3132	D3	3152	B3	3171	A1	3238	E2	6110	D10	7125	C10	9125	B9	9157	F10
2108	B4	2125	C3	2150	C3	2196	D5	3116	D4	3134	E9	3153	F5	3172	A1	3239	D3	6122	A10	7151	E9	9128	C9		
2109	D4	2127	C3	2151	B2	2197	D5	3117	E4	3135	C3	3155	C11	3173	A1	3240	F4	6123	A10	9101	D7	9130	B10		
2110	C3	2128	D3	2152	B10	2210	B9	3118	D8	3137	D10	3156	C1	3190	C2	5103	B9	7103	C9	9107	F7	9132	C9		
2111	B2	2129	D10	2153	B2	2215	E2	3120	F9	3138	E8	3157	D2	3194	E3	5104	B9	7104	E10	9108	E7	9133	B10		
2112	C3	2131	C10	2154	B2	2221	D2	3121	B3	3139	C2	3158	C10	3196	B2	5105	D9	7105	B10	9111	B8	9134	C10		
2113	B3	2132	F3	2155	B2	2224	F3	3122	D3	3141	F4	3159	A2	3197	C1	5106	E10	7106	A11	9113	D8	9136	C10		
2114	E9	2133	F2	2156	B11	2225	F2	3123	E3	3142	F4	3160	A2	3198	C2	5108	C7	7107	B1	9114	F8	9138	B10		



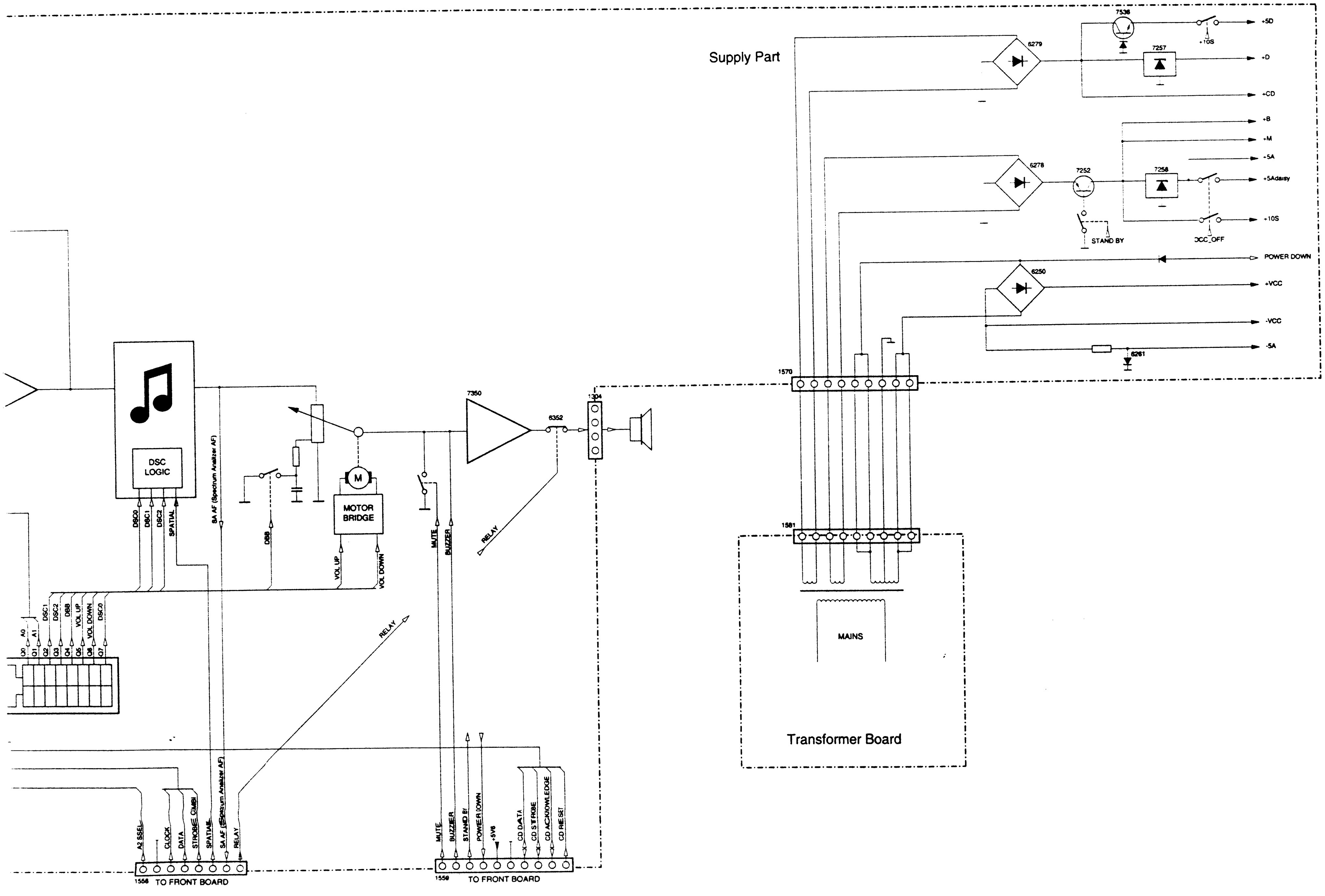
# NOT FOR JAPAN
⧗ ONLY FOR JAPAN

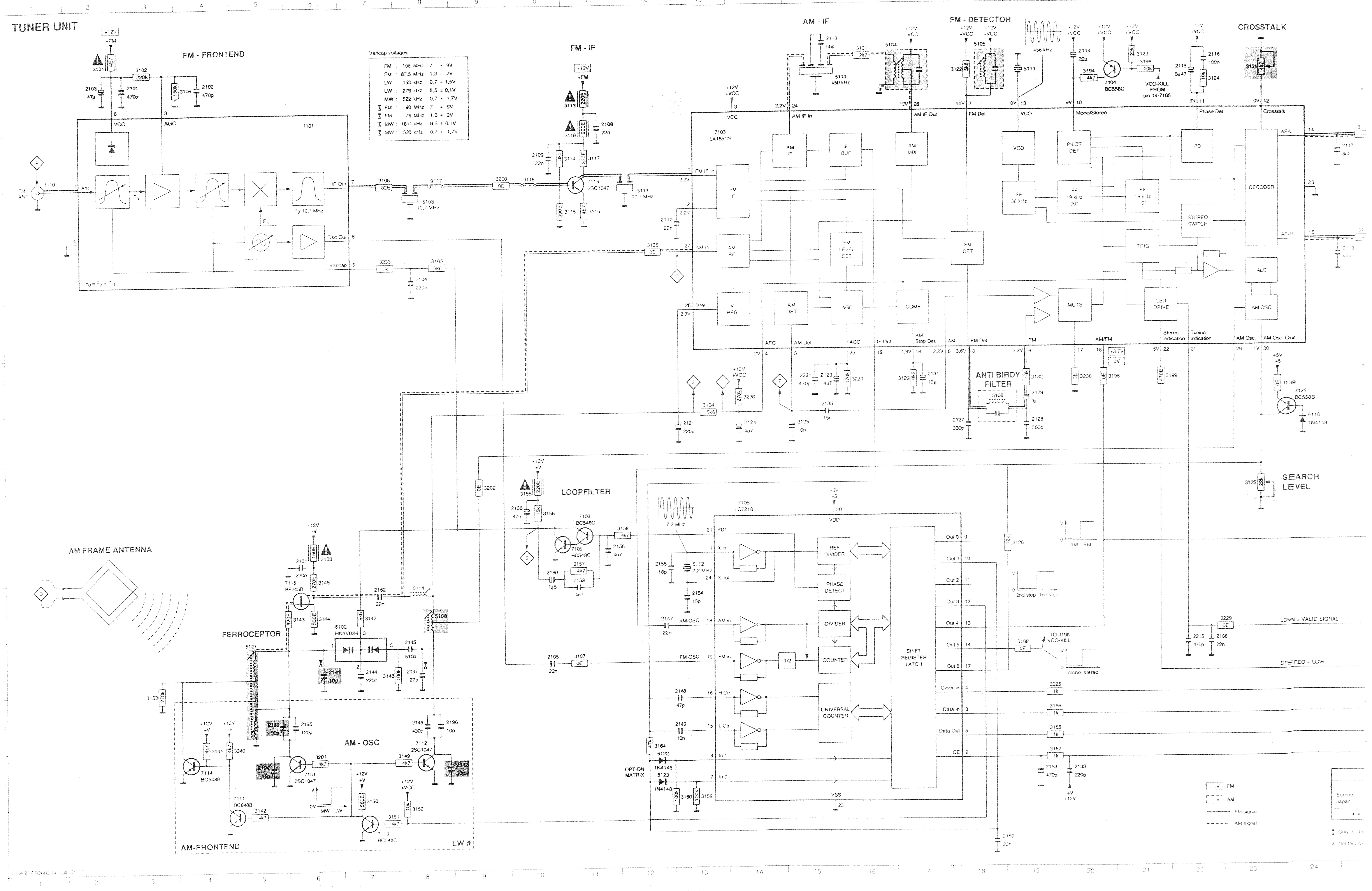
3104-217-03800 .7

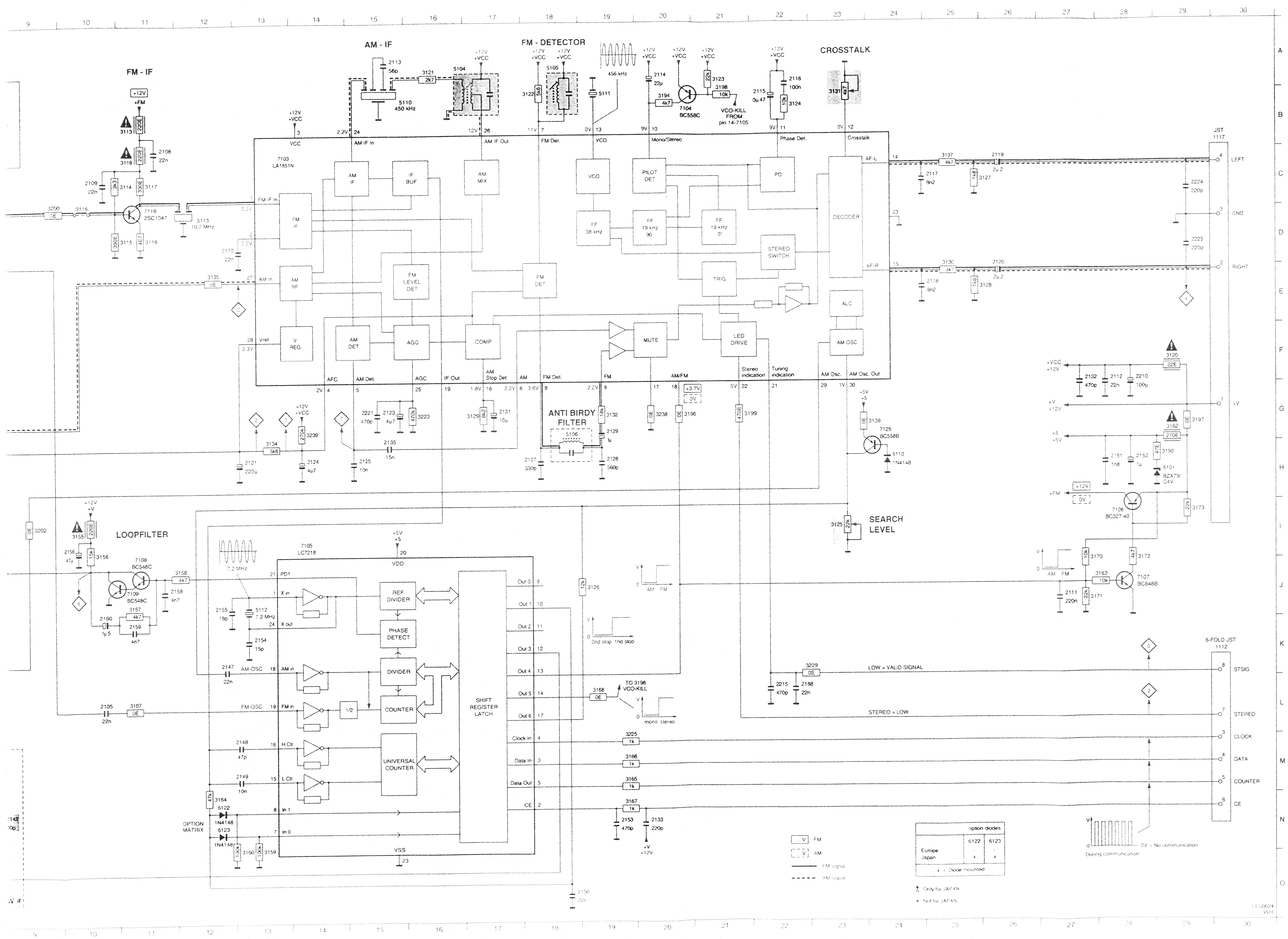
FUNCTIONAL DIAGRAM *COMBI BOARD*


Audio Frequency Part
Supply Part
AUX LEFT
AUX RIGHT
AUX
TO TUNER BOARD
1564
TUNER LEFT
TUNER RIGHT
+8
TUNER
RECORDING
TO TAPE BOARD
1580
PLAYBACK RIGHT
PLAYBACK LEFT
REC LEFT
REC RIGHT
+8
TAPE
RECORDING
TO DCC BOARD
1570
REC LEFT
REC RIGHT
NMUTE
PLAYBACK RIGHT
+5A DAISY
PLAYBACK LEFT
DCC
TO CD BOARD
1567
CD LEFT
CD RIGHT
CD RESET
CD ACKNOWLEDGE
CD STROBE
CD DATA
CD
7551
HEF4052B
AUX
TUNER
TAPE
DCC
ENABLE
SELECTOR LOGIC
A0
A1
A2 SEL
SELECTOR LOGIC
A0
A1
ENABLE
CD
HEF4052B
7562
7505, 7506
DSC LOGIC
DSC0
DSC1
DSC2
SPATIAL
SA AF (Spectrum Analizer AF)
DBB
VOL UP
VOL DOWN
M
MOTOR BRIDGE
7350
MUTE
BUZZER
RELAY
6352
1304
A0
A1
DSC1
DSC2
DBB
VOL UP
VOL DOWN
DSC0
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
7500
HEF4094
DATA
CLOCK
STROBE
RELAY
A2 SSEL
CLOCK
DATA
STROBECOMBI
SPATIAL
SA AF (Spectrum Analizer AF)
RELAY
1558
TO FRONT BOARD
MUTE
BUZZER
STAND BY
POWERDOWN
+5V6
CD DATA
CD STROBE
CD ACKNOWLEDGE
CD RESET
1559
TO FRONT BOARD
1570
1581
MAINS
Transformer Bo

CS 52 055

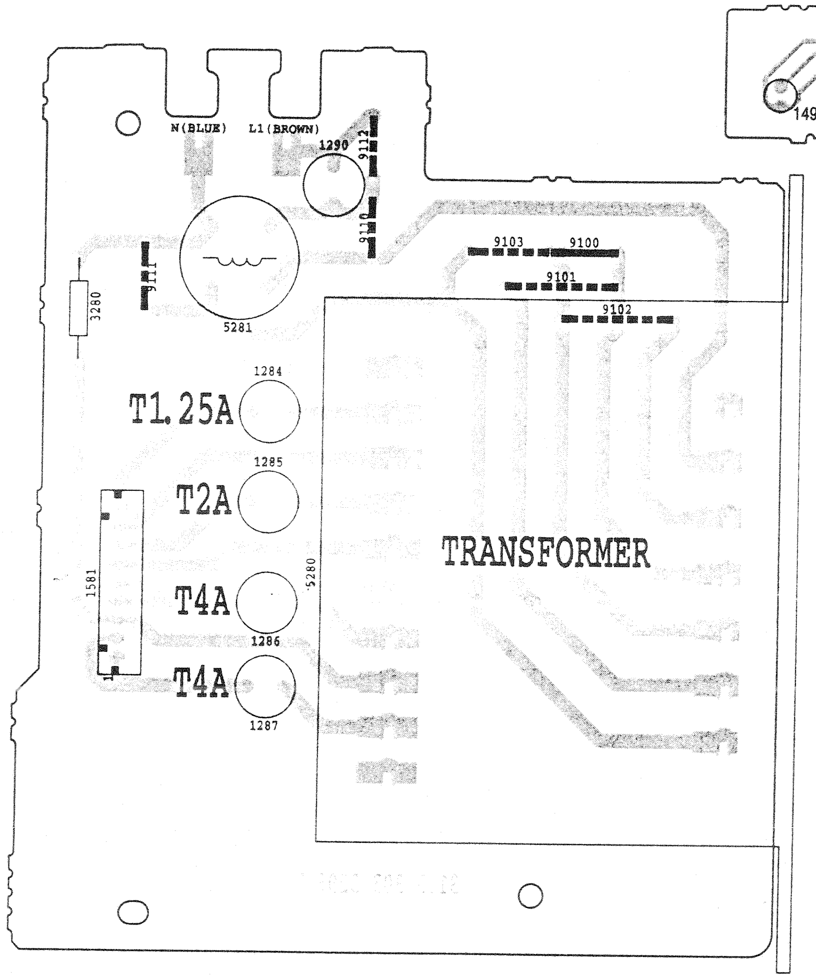

Supply Part
7536
6279
+10S
7257
+5D
+D
+CD
+B
+M
+5A
6278
7252
7258
+5Adaisy
+10S
STAND BY
DCC_OFF
POWER DOWN
6250
+VCC
-VCC
-5A
6261
1570
DSC LOGIC
DSC0
DSC1
DSC2
SPATIAL
SA AF (Spectrum Analizer AF)
DBB
M
MOTOR BRIDGE
VOL UP
VOL DOWN
7350
MUTE
BUZZER
RELAY
6352
1304
1581
MAINS
Transformer Board
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
A0
A1
DSC1
DSC2
DBB
VOL UP
VOL DOWN
DSC0
RELAY
A2 SSEL
CLOCK
DATA
STROBE COMBI
SPATIAL
SA AF (Spectrum Analizer AF)
RELAY
1558
TO FRONT BOARD
MUTE
BUZZER
STAND BY
POWER DOWN
+5V6
CD DATA
CD STROBE
CD ACKNOWLEDGE
CD RESET
1559
TO FRONT BOARD


TUNER UNIT
FM - FRONTEND
1101
VCC
AGC
Ant
IF Out
Osc Out
Vancap
Fo = Fa + Fif
Fif 10,7 MHz
FM ANT
1110
Vancap voltages
FM : 108 MHz 7 ÷ 9V
FM : 87,5 MHz 1,3 ÷ 2V
LW : 153 kHz 0,7 ÷ 1,5V
LW : 279 kHz 8,5 ± 0,1V
MW : 522 kHz 0,7 ÷ 1,7V
FM : 90 MHz 7 ÷ 9V
FM : 76 MHz 1,3 ÷ 2V
MW : 1611 kHz 8,5 ± 0,1V
MW : 530 kHz 0,7 ÷ 1,7V
FM - IF
7116 2SC1047
5103 10,7 MHz
5113 10,7 MHz
AM - IF
5110 450 kHz
5104
FM - DETECTOR
5105
456 kHz
5111
7104 BC558C
VCO-KILL FROM pin 14-7105
CROSSTALK
7103 LA1851N
FM IF In
AM In
Vref
AM IF In
AM IF Out
FM Del.
VCO
Mono/Stereo
Phase Det.
Crosstalk
AM IF
IF BUF
AM MIX
FM IF
AM RF
FM LEVEL DET
V REG
AM DET
AGC
COMP
FM DET
VCO
FF 38 kHz
PILOT DET
FF 19 kHz 90°
FF 19 kHz 0°
PD
STEREO SWITCH
TRIG
DECODER
MUTE
LED DRIVE
ALC
AM OSC
AF-L
AF-R
AFC
AM Det.
IF Out
AM Stop Det.
AM
FM Det.
FM
AM/FM
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
ANTI BIRDY FILTER
5106
7125 BC558B
6110 1N4148
SEARCH LEVEL
3125 22k
LOOPFILTER
7108 BC548C
7109 BC548C
7105 LC7218
7,2 MHz
5112 7,2 MHz
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
REF DIVIDER
PHASE DETECT
DIVIDER
1/2
COUNTER
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock in
Data In
Data Out
CE
AM-OSC
FM-OSC
OPTION MATRIX
6122 1N4148
6123 1N4148
AM FM
2nd stop 1nd stop
TO 3198 VCO-KILL
mono stereo
LOW = VALID SIGNAL
STEREO = LOW
AM FRAME ANTENNA
FERROCEPTOR
5127
7115 BF245B
6102 HN1V02H
5114
5108
AM - OSC
7112 2SC1047
7151 2SC1047
7114 BC548B
7111 BC848B
7113 BC548C
MW LW
AM-FRONTEND
LW #
V FM
V AM
FM signal
AM signal
Europe
Japan
Only for JAP
Not for JAP

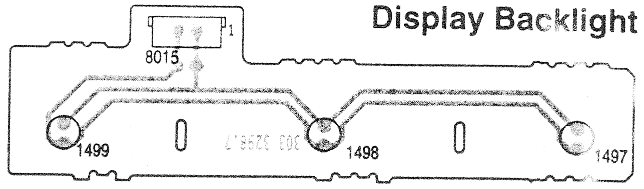

FM - IF
AM - IF
FM - DETECTOR
CROSSTALK
LOOPFILTER
ANTI BIRDY FILTER
SEARCH LEVEL
7103
LA1851N
VCC
AM IF In
AM IF Out
FM Det.
VCO
Mono/Stereo
Phase Det.
Crosstalk
FM IF In
AM In
Vref
AM IF
IF BUF
AM MIX
VCO
PILOT DET
PD
FM IF
FF 38 kHz
FF 19 kHz 90
FF 19 kHz 0°
DECODER
STEREO SWITCH
AM RF
FM LEVEL DET
FM DET
TRIG
ALC
V REG
AM DET
AGC
COMP
MUTE
LED DRIVE
AM OSC
AFC
AM Det.
AGC
IF Out
AM Stop Det.
AM
FM Det.
FM
AM/FM
Stereo indication
Tuning indication
AM Osc.
AM Osc. Out
AF-L
AF-R
5110 450 kHz
5113 10,7 MHz
7116 2SC1047
456 kHz
7104 BC558C
VCO-KILL FROM pin 14-7105
JST 1117
LEFT
GND
RIGHT
+V
7125 BC558B
6110 1N4148
6101 BZX79/ C4V
7106 BC327-40
7107 BC848B
7108 BC548C
7109 BC548C
7105 LC7218
VDD
PD1
X in
X out
AM in
FM in
H Ctr.
L Ctr.
In 1
In 0
VSS
7,2 MHz
5112 7,2 MHz
REF DIVIDER
PHASE DETECT
DIVIDER
COUNTER
1/2
UNIVERSAL COUNTER
SHIFT REGISTER LATCH
Out 0
Out 1
Out 2
Out 3
Out 4
Out 5
Out 6
Clock in
Data In
Data Out
CE
AM-OSC
FM-OSC
OPTION MATRIX
6122 1N4148
6123 1N4148
TO 3198 VCO-KILL
2nd stop 1nd stop
mono stereo
AM FM
LOW = VALID SIGNAL
STEREO = LOW
6-FOLD JST 1112
STSIG
STEREO
CLOCK
DATA
COUNTER
CE
V FM
V AM
FM signal
AM signal
option diodes
6122
6123
Europe
Japan
x = Diode mounted
Only for JAPAN
# Not for JAPAN
0V = No communication
During communication
LEU0024
9516

1101	B6	3190	H29
1110	C1	3194	B20
1112	K30	3196	G20
1117	B30	3197	G29
2101	B3	3198	A21
2102	B4	3199	G21
2103	B2	3200	C9
2104	E8	3201	N6
2105	L10	3202	I9
2108	B11	3223	G16
2109	C10	3225	L19
2110	D12	3229	K22
2111	J27	3233	E7
2112	F28	3238	G20
2113	A15	3239	G14
2114	A20	3240	N4
2115	B22	5103	D8
2116	A22	5104	A16
2117	C25	5105	A18
2118	E25	5106	G18
2119	C26	5108	K8
2120	D26	5110	B15
2121	H13	5111	B19
2123	G15	5112	J13
2124	H14	5113	D12
2125	H15	5114	K8
2127	H18	5127	L5
2128	H19	6101	H29
2129	G19	6102	K6
2131	G17	6110	H24
2132	F27	6122	N12
2133	N20	6123	N12
2135	G15	7103	C13
2141	L6	7104	B20
2142	N9	7105	I14
2144	L7	7106	I28
2145	L8	7107	J28
2146	M8	7108	I11
2147	K12	7109	J11
2148	M12	7111	N4
2149	M12	7112	M8
2150	O18	7113	O7
2151	H28	7114	N4
2152	H28	7115	K5
2153	N19	7116	C11
2154	K13	7125	G24
2155	J12	7151	N6
2156	I10	9116	C10
2158	J11	9117	C8
2159	K11		
2160	J10		
2161	J6		
2162	K7		
2188	L22		
2193	M5		
2194	N5		
2195	M6		
2196	M8		
2197	L8		
2210	F28		
2215	L22		
2221	G15		
2224	C29		
2225	D29		
3101	A2		
3102	A3		
3104	B4		
3105	E8		
3106	C7		
3107	L11		
3113	B11		
3114	C11		
3115	D11		
3116	D11		
3117	C11		
3118	C11		
3120	F29		
3121	A16		
3122	B18		
3123	A21		
3124	B22		
3125	I23		
3126	J19		
3127	C26		
3128	E26		
3129	G17		
3130	D25		
3131	B23		
3132	G19		
3134	G13		
3135	E12		
3137	C25		
3138	J6		
3139	G24		
3141	N4		
3142	O5		
3143	K6		
3144	K6		
3145	K6		
3147	K7		
3148	L7		
3149	N7		
3150	N7		
3151	O7		
3152	O8		
3153	M3		
3155	I10		
3156	I10		
3157	J11		
3158	J11		
3159	N13		
3160	N13		
3162	G29		
3163	J27		
3164	N12		
3165	M19		
3166	M19		
3167	N19		
3168	L19		
3170	J27		
3171	J27		
3172	J28		
3173	I29		

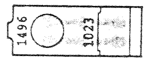
Transformer Board Componentside view


N(BLUE)
L1(BROWN)
1290
9112
9110
9111
3280
5281
9103
9100
9101
9102
1284
T1,25A
1285
T2A
1581
T4A
1286
5280
T4A
1287
TRANSFORMER

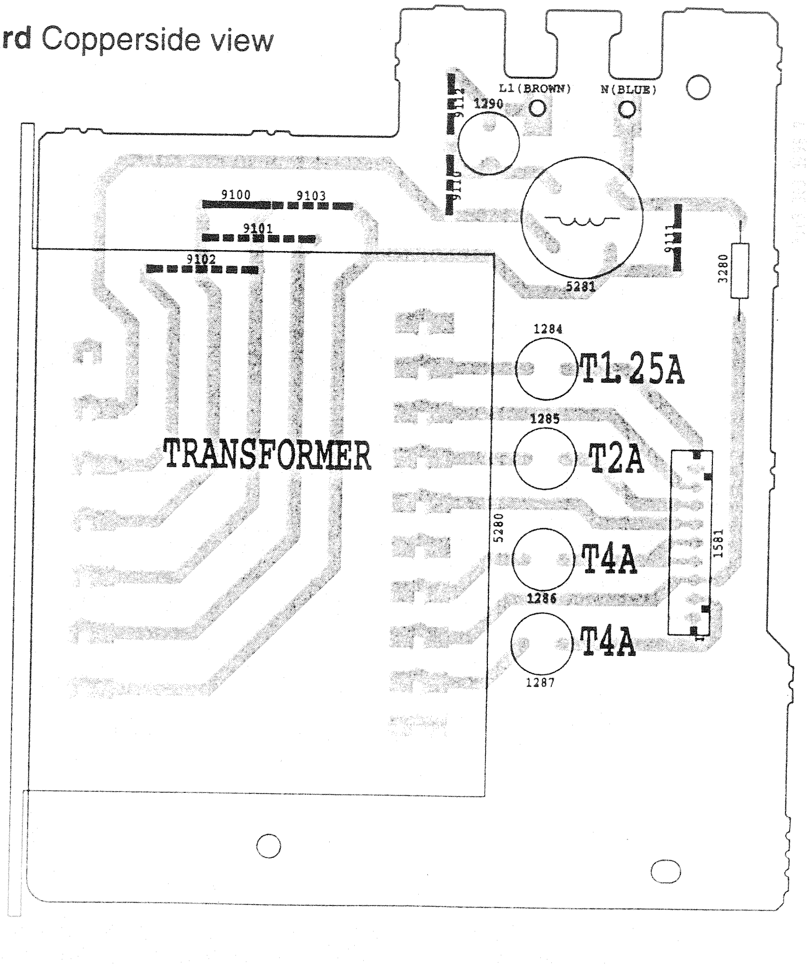
Display Backlight


8015
1499
1498
1497

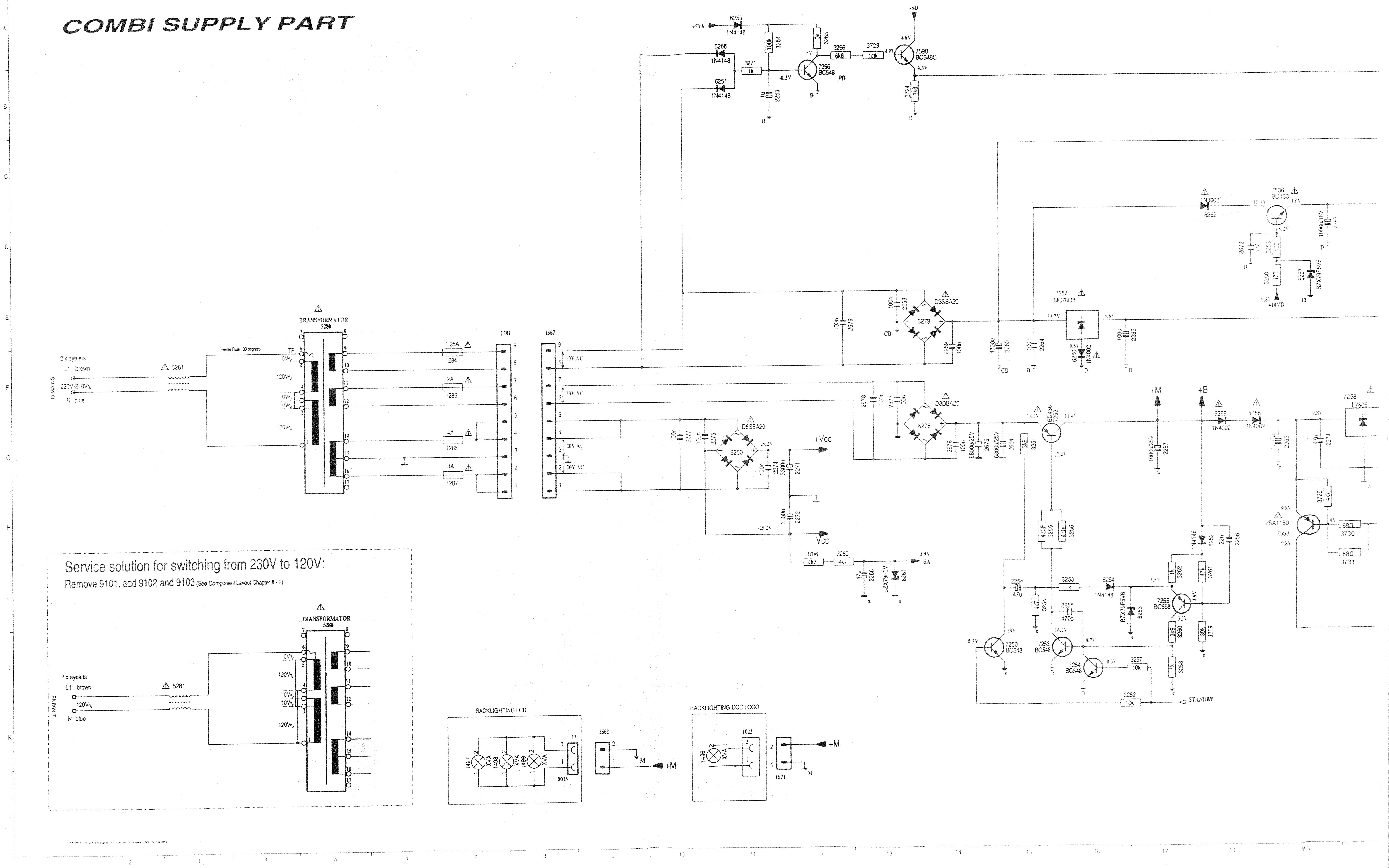
DCC Logo Backlight



Transformer Board Copperside view


L1(BROWN)
N(BLUE)
1290
9112
9110
9100
9103
9101
9102
5281
9111
3280
1284
T1,25A
1285
T2A
TRANSFORMER
5280
T4A
1581
1286
T4A
1287

COMBI SUPPLY PART

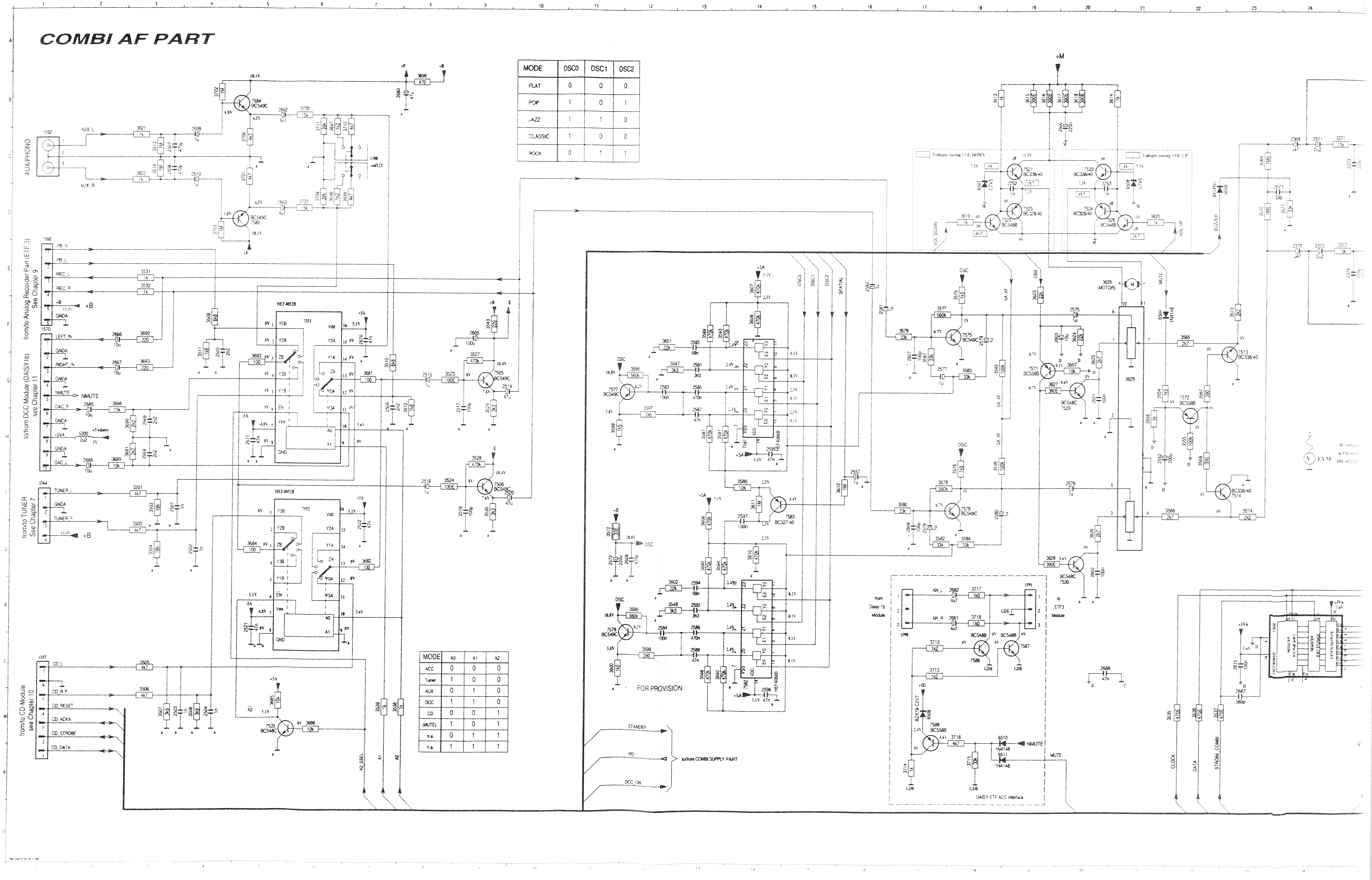

TRANSFORMATOR 5280
2 x eyelets
L1 brown
N blue
to MAINS
220V-240V
5281
Thermo Fuse 130 degrees
TF
0V
120V
10V
1.25A 1284
2A 1285
4A 1286
4A 1287
1581
1567
10V AC
20V AC
+5V6
6259 1N4148
6266 1N4148
6251 1N4148
3271 1k
3264 100k
3265 10k
2263 1u
7256 BC548
PD
-0.2V
5V
3266 6k8
3723 33k
4.9V
4.6V
7590 BC548C
4.3V
+5D
3724 1k8
D
2679 100n
2258 100n
D3SBA20
6279
CD
2259 100n
2260 4700u
2264 100n
7257 MC78L05
11.2V
5.6V
0.6V
6260 1N4002
2265 100u
6262 1N4002
7536 BD433
2683 1000u/16V
2672 4n7
3253 100
3250 470
6267 BZX79F5V6
+10VD
2277 100n
2275 100n
D5SBA20
6250
25.2V
+Vcc
2274 100n
2271 3300u
2272 3300u
-25.2V
-Vcc
3706 4k7
3269 4k7
-4.8V
-5A
2266 47u
6261 BZX79F5V1
2678 100n
2677 100n
D3DBA20
6278
2676 100n
2675 6800u/25V
2684 6800u/25V
3251 3k9
7252 BD436
18.2V
11.4V
17.4V
+M
+B
2257 1000u/25V
6269 1N4002
6268 1N4002
2262 100n
2674 47n
7258 L7805
9.8V
3725 4k7
7553 2SA1160
3730 680
3731 680
9V
3255 470E
3256 470E
6252 1N4148
2256 22n
3262 1k
3261 47k
2254 47u
3254 4k7
3263 1k
6254 1N4148
6253 BZX79F5V6
7255 BC558
3260 3k9
3259 39k
2255 470p
7250 BC548
7253 BC548
7254 BC548
3257 10k
3258 1k
3252 10k
STANDBY
0.3V
18V
16.2V
0.7V
3.3V
5.5V
BACKLIGHTING LCD
1497 XVA
1498 XVA
1499 XVA
17
8015
1561
M
+M
BACKLIGHTING DCC LOGO
1496 XVA
1023
1571

Service solution for switching from 230V to 120V:

Remove 9101, add 9102 and 9103 (See Component Layout Chapter 8 - 2)

1304	B32
1550	H31
1552	C 1
1554	C 9
1557	N 1
1558	L31
1559	J31
1560	E 1
1564	I 1
1570	F 1
1580	C 7
1590	K16
1591	K18
2252	C19
2253	C20
2364	G27
2365	C28
2366	C28
2367	F26
2368	G26
2369	C24
2370	E24
2371	C24
2372	E24
2373	C25
2374	E25
2375	C25
2376	E25
2377	C26
2378	E26
2379	C26
2380	E26
2381	I29
2382	I29
2385	D28
2386	E28
2387	C28
2388	E28
2389	C31
2390	D31
2391	B31
2392	D30
2501	I 3
2502	J 4
2503	M 3
2504	M 4
2505	F 4
2506	G 7
2507	C 3
2508	C 3
2509	C 4
2510	C 4
2515	G 8
2516	I 8
2517	G 9
2518	I 9
2519	G 9
2520	I 9
2521	K 5
2522	J 7
2552	H21
2571	D23
2572	J11
2575	F20
2576	I20
2577	G17
2578	J17
2579	F18
2580	I18
2581	F16
2582	E16
2583	G12
2584	K12
2585	G13
2586	K13
2587	H13
2588	L13
2591	G13
2592	K13
2593	F13
2594	K13
2595	H14
2596	M14
2597	I14
2600	C19
2601	G20
2602	J20
2603	F19
2605	F 9
2607	G17
2608	J17
2609	J12
2615	L23
2616	K27
2617	K27
2657	I16
2662	B 5
2663	D 5
2666	F 2
2667	G 2
2668	H 3
2669	H 3
2670	F 7
2671	H 5
2680	B 7
2681	K17
2682	K17
2685	G 2
2686	H 2
2687	M23
2688	L20
3301	F27
3302	G27
3303	G28
3304	F30
3351	D27
3360	B28
3361	F26
3362	G27
3363	D26
3368	G27
3371	C25
3372	E25
3373	C25
3374	E25
3375	C26
3376	E26
3377	C28
3378	E28
3379	C27
3380	D27
3381	D28
3382	D28
3383	B31
3384	D31
3385	B27
3386	F27
3387	F29
3388	G29
3389	G29
3390	G29
3399	G30
3400	G31
3401	B30
3402	B30
3403	B30
3404	B30
3405	C30
3406	C30
3407	C30
3408	D30
3409	D30
3410	D30
3411	B30
3412	D30
3415	A27
3416	E30
3501	I 3
3502	J 3
3503	I 3
3504	J 3
3505	L 3
3506	M 3
3507	M 3
3508	M 4
3509	F 4
3510	G 7
3511	F 4
3512	G 8
3513	C 3
3514	C 3
3523	G 8
3524	I 8
3527	G 9
3528	H 9
3529	G 9
3530	I 9
3531	E 3
3532	E 3
3535	M22
3536	M22
3537	M22
3538	M 7
3539	M 7
3540	N26
3541	N26
3542	M27
3543	F 9
3545	G18
3546	H18
3547	G12
3548	K12
3554	G21
3555	H22
3556	H21
3557	G20
3565	F22
3566	I22
3567	G22
3568	H22
3569	C23
3570	D23
3571	D24
3572	J11
3573	F23
3574	I23
3575	E18
3576	I18
3577	F17
3578	I17
3579	F17
3580	I17
3581	G17
3582	J17
3583	G18
3584	J18
3585	I14
3587	H13
3588	L13
3589	F13
3590	J13
3591	H13
3592	L13
3593	F13
3594	J13
3595	G12
3596	K12
3597	G12
3598	L12
3599	H11
3600	L11
3601	F12
3602	K12
3607	E14
3608	I13
3609	F14
3610	J14
3611	I14
3612	I15
3613	C18
3614	C20
3615	B19
3616	B19
3617	B19
3618	B20
3619	D18
3620	D21
3621	C 3
3622	C 3
3623	E19
3624	F20
3625	G20
3626	J20
3627	G19
3628	J19
3629	G21
3681	G 7
3682	J 7
3683	G 5
3684	J 5
3685	M 5
3686	M 6
3688	G 2
3689	H 2
3690	H 3
3691	H 3
3692	F 3
3693	G 3
3696	D 6
3697	B 6
3698	B 8
3699	D 6
3700	C 5
3701	C 5
3702	B 4
3703	D 4
3709	D 6
3710	B 6
3711	B 6
3712	L17
3713	L17
3714	N16
3715	N17
3716	M17
3717	K17
3718	K17
3720	B 6
3721	D 6
3726	F29
5300	H 2
5313	C29
5371	B31
5372	D31
5373	H29
5374	H29
6352	E29
6504	F21
6505	D22
6507	C18
6508	C21
6509	M16
6510	M18
6511	N18
7318	G29
7319	G28
7320	G31
7350	B26
7502	K23
7505	G 9
7506	I 9
7513	F23
7514	I23
7521	C19
7522	C20
7523	D19
7524	D20
7525	D18
7526	D20
7529	G19
7530	J19
7535	M 5
7551	F 6
7552	I 6
7571	G19
7572	G22
7575	F18
7576	I18
7577	G11
7578	K11
7581	H14
7582	L14
7583	I15
7584	B 5
7585	
7586	
7587	
7588	

COMBI AF PART

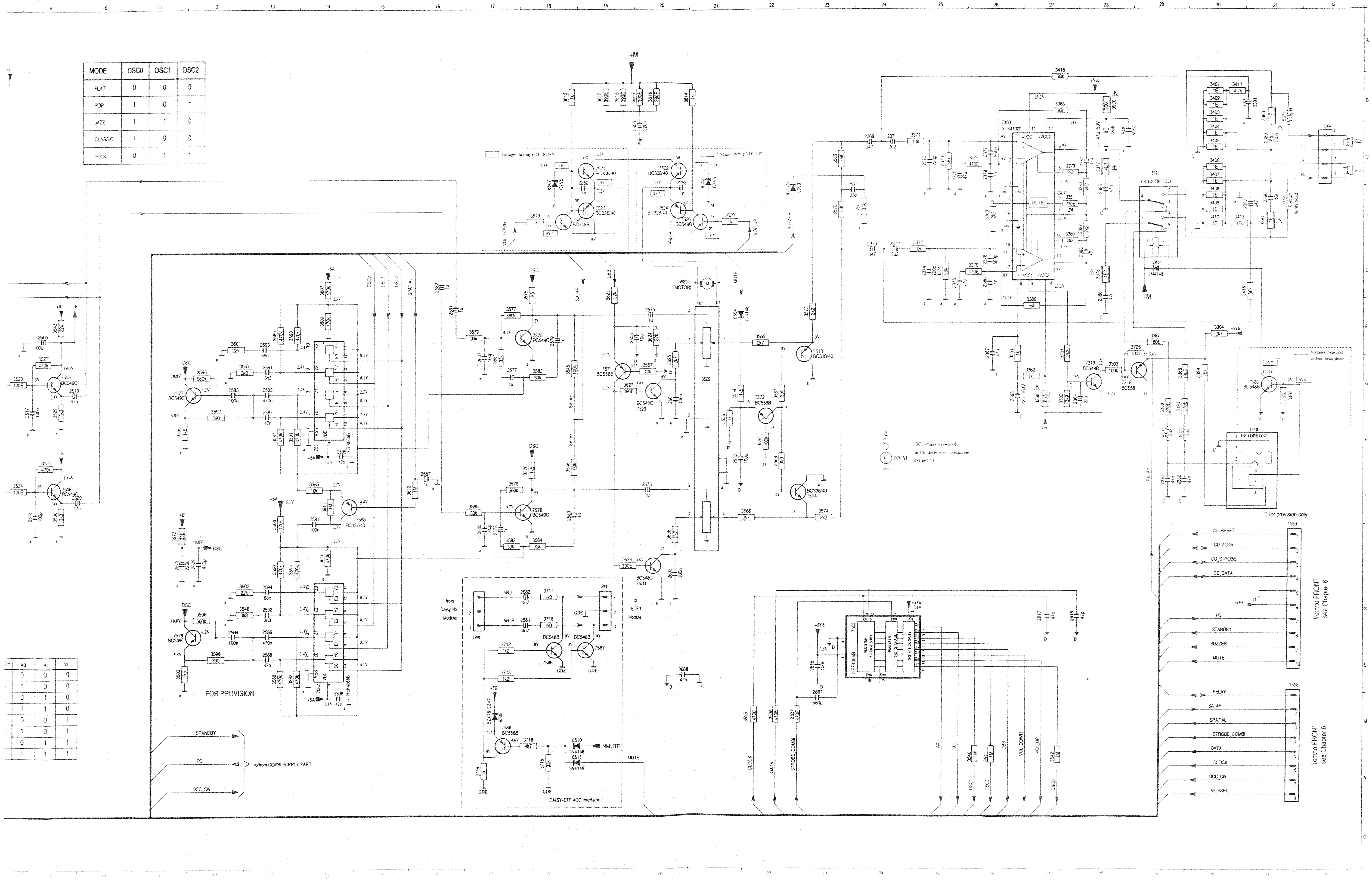


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
A B C D E F G H I J K L M N
AUX/PHONO
1552
AUX_L
AUX_R
from/to Analog Recorder Part (ETF 3) See Chapter 9
1560
PB_R
PB_L
REC_L
REC_R
+B
GNDA
to/from DCC Module (DAISY1b) see Chapter 11
1570
LEFT_IN
RIGHT_IN
NMUTE
DAC_R
-5VA
DAC_L
from/to TUNER See Chapter 7
1564
TUNER_L
TUNER_R
from/to CD-Module see Chapter 10
1557
CD_L
CD_R
CD_RESET
CD_ACKN
CD_STROBE
CD_DATA
HEF4052B
7551
7552
Y0B
Y2B
ZB
Y3B
Y1B
Y2A
Y1A
ZA
Y0A
Y3A
EN
Vee
Vdd
A0
A1
GND
7584 BC549C
7585 BC549C
7505 BC549C
7506 BC549C
7535 BC548C
A2_SSEL
A1
A0
+F
+B
+E
+M
HEF4066B
7581
7582
7577 BC549C
7578 BC549C
7583 BC327/40
FOR PROVISION
DSC
DSC0
DSC1
DSC2
SPATIAL
7575 BC549C
7576 BC549C
7571 BC558B
7529 BC548C
7530 BC548C
3629 (MOTOR)
3629
SA AF
DBB
MUTE
BUZZER
VOL DOWN
VOL UP
Voltages during VOL DOWN
Voltages during VOL UP
7521 BC338/40
7522 BC338/40
7523 BC328/40
7524 BC328/40
7525 BC548B
7526 BC548B
7513 BC338/40
7514 BC338/40
7572 BC558B
EVM
STANDBY
PD
DCC_ON
to/from COMBI SUPPLY PART
from Daisy 1b Module
to ETF3 Module
1590
1591
AN_L
AN_R
GDE
7586 BC548B
7587 BC548B
7588 BC558B
BZX79-C2V7
NMUTE
MUTE
6510 1N4148
6511 1N4148
DAISY/ETF ACC Interface
CLOCK
DATA
STROBE COMBI

MODE	DSC0	DSC1	DSC2
FLAT	0	0	0
POP	1	0	1
JAZZ	1	1	0
CLASSIC	1	0	0
ROCK	0	1	1

MODE	A0	A1	A2
ACC	0	0	0
Tuner	1	0	0
AUX	0	1	0
DCC	1	1	0
CD	0	0	1
(MUTE)	1	0	1
n.a.	0	1	1
n.a.	1	1	1

2686	H 2
2687	M21
2688	L20
3301	F27
3302	G27
3303	G28
3304	F30
3351	D27
3360	B28
3361	F26
3362	G27
3363	D26
3368	G27
3371	C25
3372	E25
3373	C25
3374	E25
3375	C26
3376	E26
3377	C28
3378	E28
3379	C27
3380	D27
3381	D28
3382	D28
3383	B31
3384	D31
3385	B27
3386	F27
3387	F29
3388	G29
3389	G29
3390	G29
3399	G30
3400	G31
3401	B30
3402	B30
3403	B30
3404	B30
3405	C30
3406	C30
3407	C30
3408	D30
3409	D30
3410	D30
3411	B30
3412	D30
3415	A27
3416	E30
3501	I 3
3502	J 3
3503	I 3
3504	J 3
3505	L 3
3506	M 3
3507	M 3
3508	M 4
3509	F 4
3510	G 7
3511	F 4
3512	G 8
3513	C 3
3514	C 3
3523	G 8
3524	I 8
3527	G 9
3528	H 9
3529	G 9
3530	I 9
3531	E 3
3532	E 3
3535	M22
3536	M22
3537	M22
3538	M 7
3539	M 7
3540	N26
3541	N26
3542	N27
3543	F 9
3545	G18
3546	H18
3547	G12
3548	K12
3554	G21
3555	H22
3556	H21
3557	G20
3565	F22
3566	I22
3567	G22
3568	H22
3569	C23
3570	D23
3571	D24
3572	J11
3573	F23
3574	I23
3575	E18
3576	I18
3577	F17
3578	I17
3579	F17
3580	I17
3581	G17
3582	J17
3583	G18
3584	J18
3585	I14
3587	H13
3588	L13
3589	F13
3590	J13
3591	H13
3592	L13
3593	F13
3594	J13
3595	G12
3596	K12
3597	G12
3598	L12
3599	H11
3600	L11
3601	F12
3602	K12
3607	E14
3608	I13
3609	F14
3610	J14
3611	I14
3612	I15
3613	C18
3614	C20
3615	B19
3616	B19
3617	B19
3618	B20
3619	D18
3620	D21
3621	C 3
3622	C 3
3623	E19
3624	F20
3625	G20
3626	J20
3627	G19
3628	J19
3629	G21
3681	G 7
3682	J 7
3683	G 5
3684	J 5
3685	M 5
3686	M 6
3688	G 2
3689	H 2
3690	H 3
3691	H 3
3692	F 3
3693	G 3
3696	D 6
3697	B 6
3698	B 8
3699	D 6
3700	C 5
3701	C 5
3702	B 4
3703	D 4
3709	D 6
3710	B 6
3711	B 6
3712	L17
3713	L17
3714	M16
3715	M17
3716	M17
3717	K17
3718	K17
3720	B 6
3721	D 6
3726	F29
5300	H 2
5313	C29
5371	B31
5372	D31
5373	H29
5374	H29
6352	E29
6504	F21
6505	D22
6507	C18
6508	C21
6509	M16
6510	M18
6511	N18
7318	G29
7319	G28
7320	G31
7350	B26
7502	K23
7505	G 9
7506	I 9
7513	F23
7514	I23
7521	C19
7522	C20
7523	D19
7524	D20
7525	D18
7526	D20
7529	G19
7530	J19
7535	M 5
7551	F 6
7552	I 6
7571	G19
7572	G22
7575	F18
7576	I18
7577	G11
7578	K11
7581	H14
7582	L14
7583	I15
7584	B 5
7585	D 5
7586	L17
7587	L18
7588	M17



9
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31
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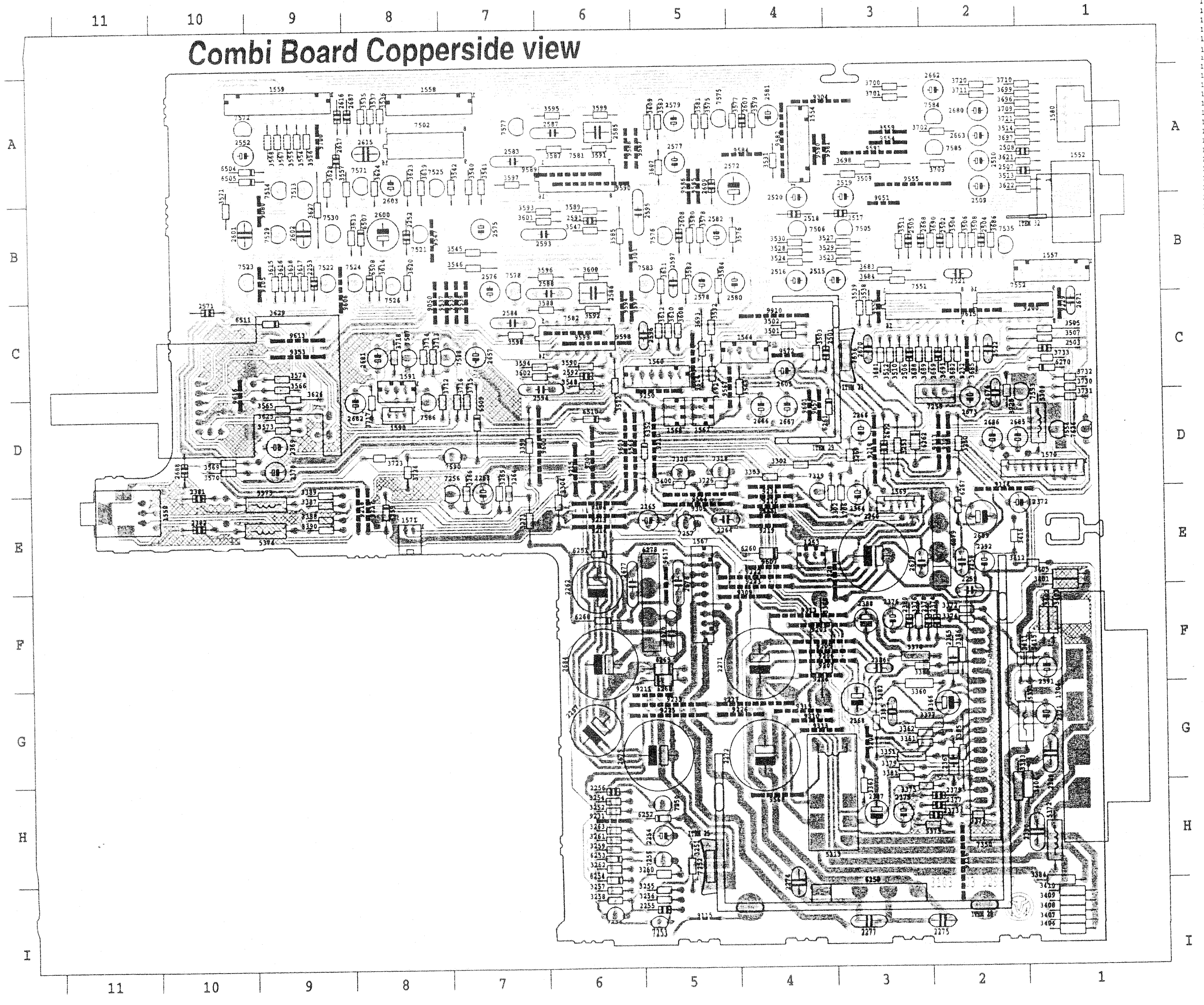
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
+M
Voltages during VOL DOWN
Voltages during VOL UP
BC338/40
BC328/40
BC548B
BC549C
BC558B
BC548C
BC327/40
C7V5
VOL_DOWN
VOL_UP
BUZZER
MUTE
DBB
DSC0
DSC1
DSC2
SPATIAL
SA_AF
DSC
HEF4066B
(MOTOR)
7350
STK4132II
+VCC1
+VCC2
-VCC1
-VCC2
-Vcc
+Vcc
MUTE
VB-12STBU4L3
1N4148
HEADPHONE
Voltages measured without headphone
DC voltages measured in FM Stereo with headphone DSC=FLAT
EVM
RELAY
*) for provision only
CD_RESET
CD_ACKN
CD_STROBE
CD_DATA
PD
STANDBY
BUZZER
MUTE
from/to FRONT see Chapter 6
RELAY
SA_AF
SPATIAL
STROBE_COMBI
DATA
CLOCK
DCC_ON
A2_SSEL
from/to FRONT see Chapter 6
HEF4094B
SHIFT REGISTER
STORAGE REGISTER
3-STATE OUTPUTS
CLOCK
DATA
STROBE_COMBI
FOR PROVISION
STANDBY
PD
DCC_ON
to/from COMBI SUPPLY PART
from Daisy 1b Module
to ETF3 Module
AN_L
AN_R
GDE
NMUTE
DAISY-ETF ACC interface

MODE	DSC0	DSC1	DSC2
FLAT	0	0	0
POP	1	0	1
JAZZ	1	1	0
CLASSIC	1	0	0
ROCK	0	1	1

A0	A1	A2
0	0	0
1	0	0
0	1	0
1	1	0
0	0	1
1	0	1
0	1	1
1	1	1

Combi Board Copperside view



1023 I 1
1253 E 4
1290 F 11
1304 G 1
1550 E 11
1552 B 1
1554 A 4
1557 B 1
1558 A 8
1559 A 9
1560 C 5
1561 D 5
1564 C 4
1567 F 5
1568 D 5
1569 E 3
1570 D 1
1571 E 8
1580 A 1
1590 D 8
1591 C 8
2252 B 8
2253 B 9
2254 H 5
2255 I 5
2256 H 6
2257 G 6
2258 E 2
2259 F 2
2260 E 3
2262 E 6
2263 E 7
2264 E 5
2265 E 5
2266 D 3
2271 F 4
2272 G 4
2274 I 4
2275 I 2
2277 I 3
2364 E 3
2365 F 2
2366 G 2
2367 G 2
2368 G 3
2369 D 9
2370 D 9
2371 G 1
2372 E 2
2373 H 2
2374 F 2
2375 H 3
2376 F 3
2377 H 2
2378 F 3
2379 H 2
2380 F 3
2381 E 10
2382 E 10
2385 G 3
2386 F 3
2387 H 3
2388 F 3
2389 G 1
2390 H 1
2391 F 1
2392 E 2
2501 C 4
2502 B 2
2503 C 1
2504 B 2
2505 B 3
2506 C 3
2507 A 1
2508 A 1
2509 A 2
2510 A 2
2515 B 3
2516 B 4
2517 B 3
2518 B 4
2519 B 3
2520 B 4
2521 B 2
2522 C 2
2552 A 10
2571 C 10
2572 A 4
2575 B 7
2576 B 7
2577 A 5
2578 B 5
2579 A 5
2580 B 4
2581 A 4
2582 B 5
2583 A 7
2584 C 7
2585 A 6
2586 B 6
2600 B 8
2601 B 10
2602 B 9
2603 A 8
2605 C 4
2607 A 4
2608 B 5

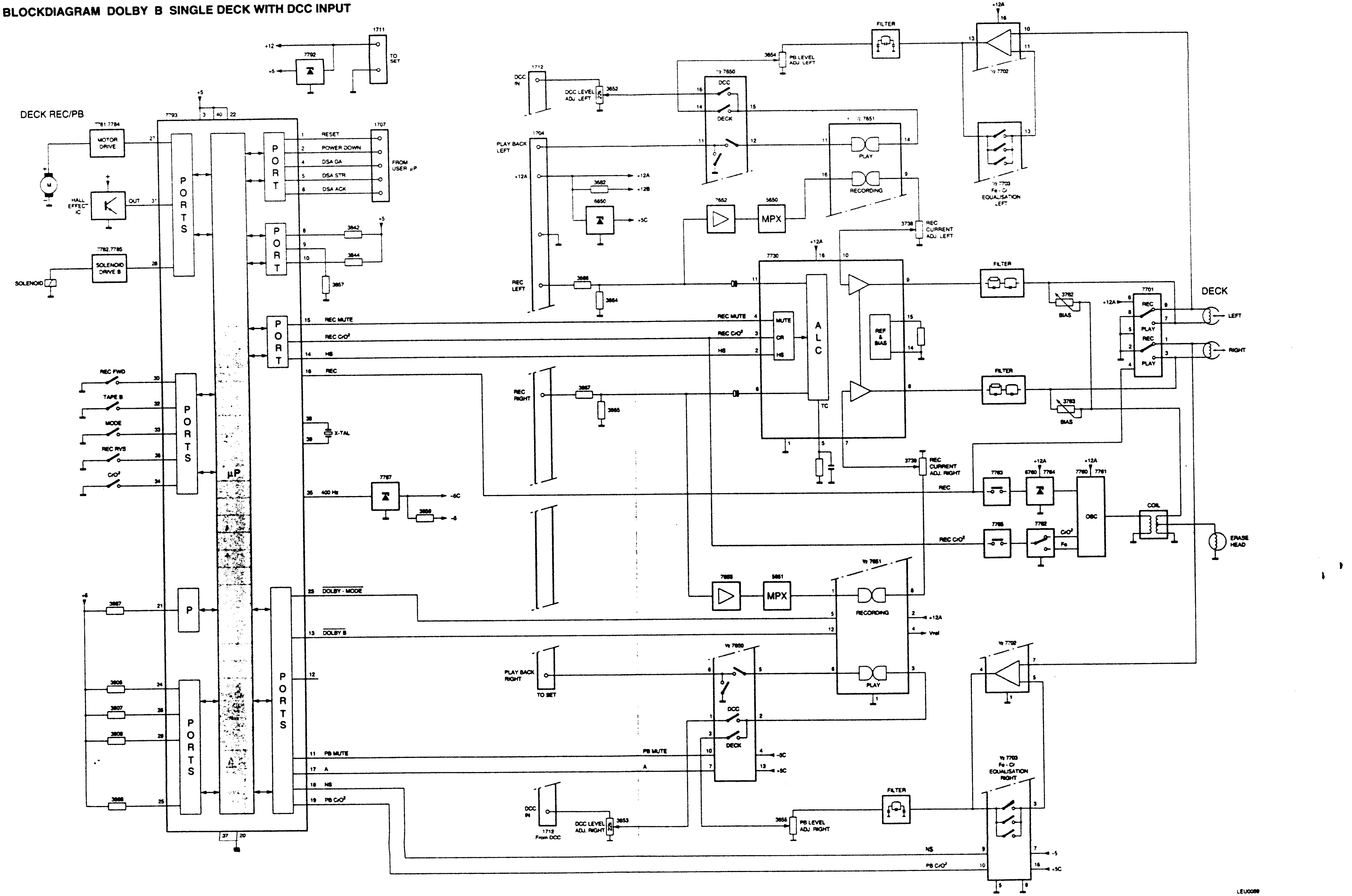
2609 A 5
2615 A 8
2616 A 9
2617 A 9
2657 C 7
2662 A 2
2663 A 2
2666 D 4
2667 D 4
2668 B 3
2669 C 2
2670 C 3
2671 C 1
2672 D 3
2673 D 2
2674 D 2
2675 G 5
2676 F 5
2677 E 6
2678 E 5
2679 E 3
2680 A 2
2681 C 8
2682 D 8
2683 E 2
2684 F 6
2685 D 2
2686 D 2
2687 A 8
2688 D 10
3250 D 2
3251 H 5
3252 H 6
3253 D 3
3254 H 6
3255 I 5
3256 I 5
3257 I 6
3258 I 6
3259 H 6
3260 H 5
3261 H 6
3262 H 6
3263 H 6
3264 E 7
3265 E 7
3266 E 7
3269 D 3
3271 E 7
3280 F 9
3301 D 4
3302 E 3
3303 D 4
3304 E 6
3351 G 3
3360 G 3
3361 G 3
3362 G 3
3363 H 3
3368 G 4
3371 H 2
3372 F 2
3373 H 2
3374 F 2
3375 H 3
3376 F 3
3377 G 3
3378 F 3
3379 G 3
3380 F 3
3381 G 3
3382 G 3
3383 H 2
3384 I 1
3385 G 2
3386 F 2
3387 E 9
3388 E 9
3389 E 9
3390 E 9
3399 D 7
3400 D 5
3401 F 1
3402 F 1
3403 F 1
3404 H 1
3405 E 1
3406 I 1
3407 I 1
3408 I 1
3409 I 1
3410 I 1
3411 F 2
3412 E 1
3415 F 1
3416 E 2
3501 C 4
3502 C 4
3503 C 4
3504 B 2
3505 C 1
3506 B 2
3507 C 1
3508 B 2
3509 A 3
3510 C 3
3511 B 3

3512 C 3
3513 A 1
3514 A 1
3523 B 3
3524 B 4
3527 B 3
3528 B 4
3529 B 3
3530 B 4
3531 A 4
3532 C 5
3535 A 8
3536 A 8
3537 A 8
3538 C 3
3539 C 3
3540 A 7
3541 A 7
3542 A 7
3543 C 4
3545 B 7
3546 B 7
3547 B 6
3548 C 6
3554 A 9
3555 A 9
3556 A 9
3557 A 8
3565 D 9
3566 C 9
3567 A 9
3568 A 9
3569 D 10
3570 D 10
3571 B 10
3572 C 6
3573 D 9
3574 C 9
3575 A 5
3576 B 4
3577 A 4
3578 B 5
3579 A 4
3580 B 5
3581 A 5
3582 B 5
3583 A 5
3584 B 5
3585 B 6
3587 A 6
3588 C 6
3589 B 6
3590 C 6
3591 A 6
3592 C 6
3593 B 6
3594 C 7
3595 A 6
3596 B 6
3597 A 7
3598 C 7
3599 A 6
3600 B 6
3601 B 6
3602 C 7
3607 A 5
3608 C 5
3609 A 5
3610 C 5
3611 B 5
3612 C 5
3613 B 8
3614 B 8
3615 B 9
3616 B 9
3617 B 9
3618 B 9
3619 A 8
3620 B 8
3621 A 1
3622 A 1
3623 A 8
3624 A 8
3625 D 9
3626 D 9
3627 B 9
3628 A 9
3629 D 9
3681 C 3
3682 C 2
3683 B 3
3684 B 3
3685 C 2
3686 B 2
3688 C 3
2587 A 6
2588 B 6
2591 B 6
2592 C 6
2593 B 6
2594 C 6
2595 B 5
2596 C 5
2597 B 5
3689 C 2
3690 B 2
3691 C 2

3692 C 5
3693 C 5
3696 A 1
3697 A 1
3698 A 3
3699 A 1
3700 A 3
3701 A 3
3702 A 2
3703 A 2
3706 E 3
3709 A 1
3710 A 1
3711 A 2
3712 D 8
3713 C 8
3714 C 8
3715 D 7
3716 D 7
3717 D 8
3718 C 8
3720 A 2
3721 A 1
3723 D 8
3724 D 8
3725 D 2
3726 D 5
3730 C 1
3731 D 1
3732 C 1
3733 C 1
5300 D 1
5313 E 4
5371 G 2
5372 E 1
5373 E 9
5374 E 9
6250 I 3
6251 E 6
6252 H 5
6253 H 6
6254 H 6
6259 E 8
6260 E 4
6261 D 4
6262 D 3
6266 F 6
6267 E 2
6268 F 5
6269 F 5
6270 C 1
6278 F 5
6279 E 2
6352 D 5
6504 A 9
6505 A 9
6507 B 8
6508 B 8
6509 D 7
6510 D 6
6511 C 9
7250 H 5
7252 H 5
7253 I 5
7254 I 6
7255 H 5
7256 E 7
7257 E 5
7258 D 2
7318 D 5
7319 E 4
7320 D 5
7350 G 2
7502 A 8
7505 B 3
7506 B 4
7513 A 9
7514 A 9
7521 B 8
7522 B 9
7523 B 9
7524 B 8
7525 A 8
7526 B 8
7529 B 9
7530 B 9
7535 B 2
7536 C 3
7551 C 2
7552 C 2
7553 D 2
7554 D 1
7571 A 8
7572 A 10
7575 A 5
7576 B 5
7577 A 7
7578 B 7
7581 A 6
7582 C 6
7583 B 5
7584 A 2
7585 A 2
7586 D 8

CS 52 060

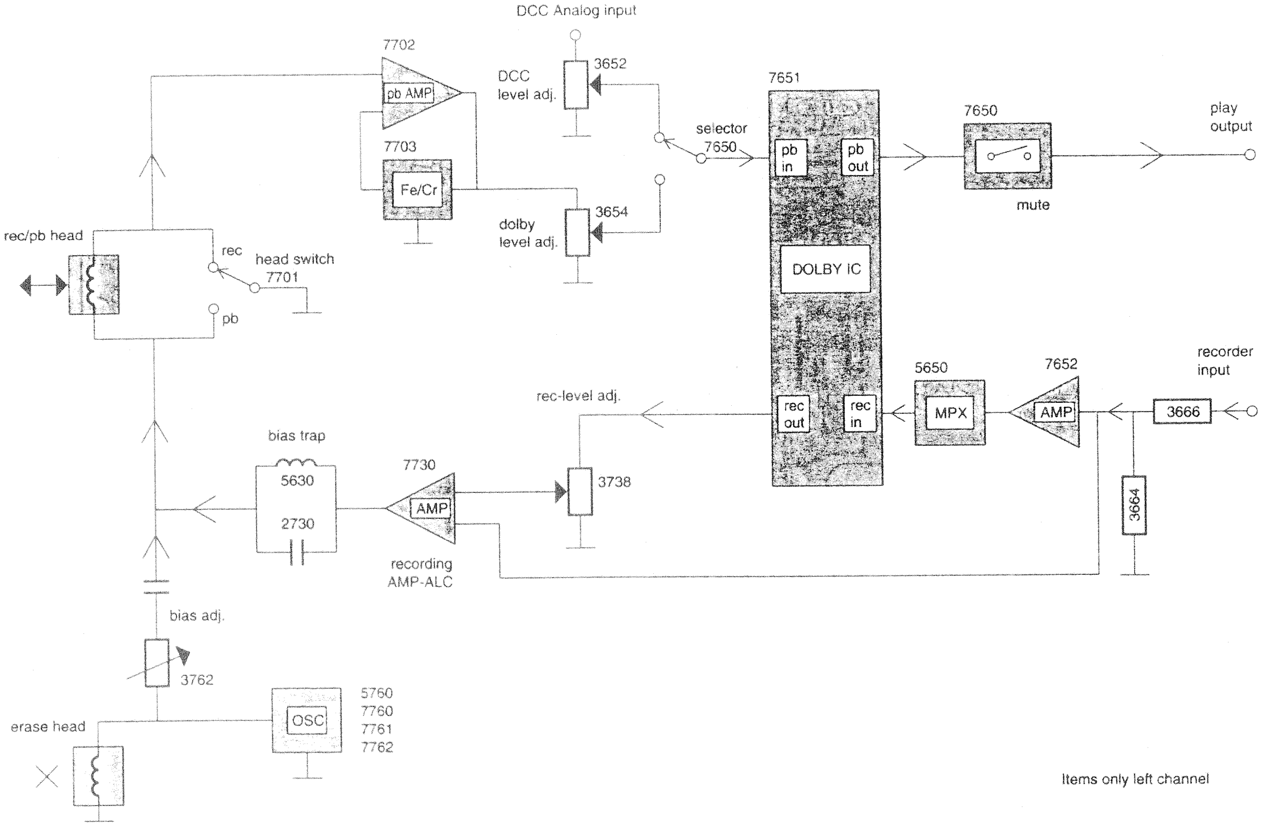
BLOCKDIAGRAM DOLBY B SINGLE DECK WITH DCC INPUT


DECK REC/PB
7781 7784
MOTOR DRIVE
M
HALL EFFECT IC
OUT
7782,7785
SOLENOID DRIVE B
SOLENOID
7793
+5
3 40 22
PORTS
PORT
RESET
POWER DOWN
DSA DA
DSA STR
DSA ACK
1707
FROM USER µP
1711
+12
+5
7792
TO SET
3842
3844
3857
REC MUTE
REC CrO²
HS
REC
REC FWD
TAPE B
MODE
REC RVS
CrO²
X-TAL
µP
400 Hz
7787
3858
-5C
-5
P
3887
3806
3807
3808
3888
DOLBY - MODE
DOLBY B
PB MUTE
A
NS
PB CrO²
37 20
1712
DCC IN
DCC LEVEL ADJ. LEFT
3852
1704
PLAY BACK LEFT
+12A
3682
6650
+12A
+12B
+5C
REC LEFT
3866
3864
REC RIGHT
3867
3865
½ 7650
DCC
DECK
3854
PB LEVEL ADJ. LEFT
FILTER
½ 7651
PLAY
RECORDING
7652
5650
MPX
3738
REC CURRENT ADJ. LEFT
+12A
½ 7702
½ 7703
Fe - Cr
EQUALISATION LEFT
7730
MUTE
CR
HS
ALC
REF & BIAS
TC
FILTER
3762
BIAS
3763
BIAS
7701
REC
PLAY
DECK
LEFT
RIGHT
3739
REC CURRENT ADJ. RIGHT
7783
6760 7784
7780 7781
OSC
COIL
ERASE HEAD
7785
7782
Fe
7653
5651
MPX
½ 7651
RECORDING
PLAY
+12A
Vref
½ 7650
DCC
DECK
-5C
+5C
PLAY BACK RIGHT
TO SET
DCC IN
1712
From DCC
DCC LEVEL ADJ. RIGHT
3853
3855
PB LEVEL ADJ. RIGHT
FILTER
½ 7702
½ 7703
Fe - Cr
EQUALISATION RIGHT
NS
PB CrO²
-5
+5C

ETF3 DOLBY B SINGLE DECK WITH DCC INPUT
3104 217 03850 bl 138 - 01

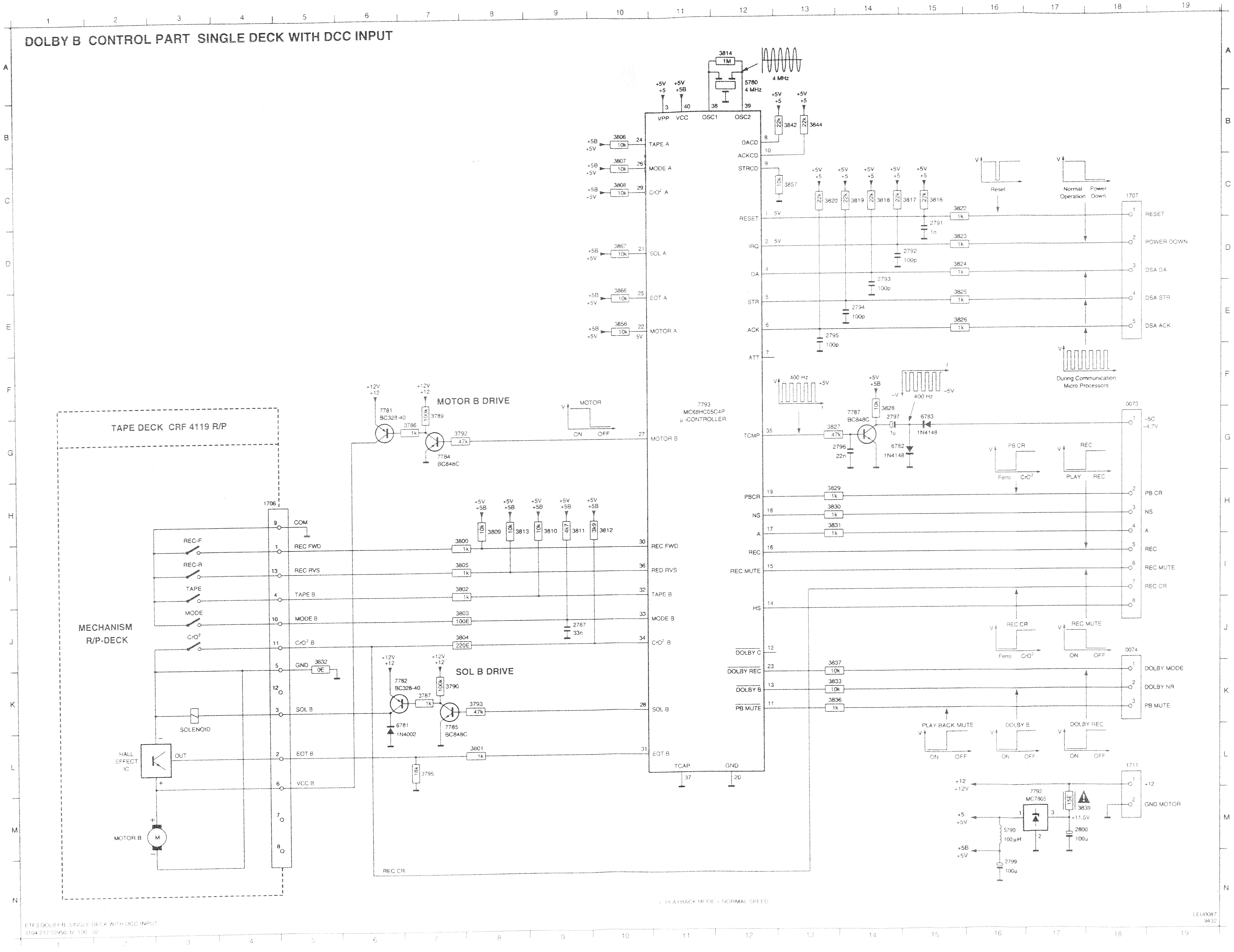
LEU0089
9432

FUNCTIONAL BLOCK DIAGRAM DOLBY B SINGLE DECK WITH DCC INPUT


DCC Analog input
7702
pb AMP
3652
DCC
level adj.
7651
7650
play
output
7703
Fe/Cr
selector
7650
pb
in
pb
out
mute
3654
dolby
level adj.
rec/pb head
rec
head switch
7701
pb
DOLBY IC
5650
7652
recorder
input
rec-level adj.
rec
out
rec
in
MPX
AMP
3666
bias trap
5630
2730
7730
AMP
3738
3664
recording
AMP-ALC
bias adj.
3762
5760
7760
7761
7762
erase head
OSC

Items only left channel

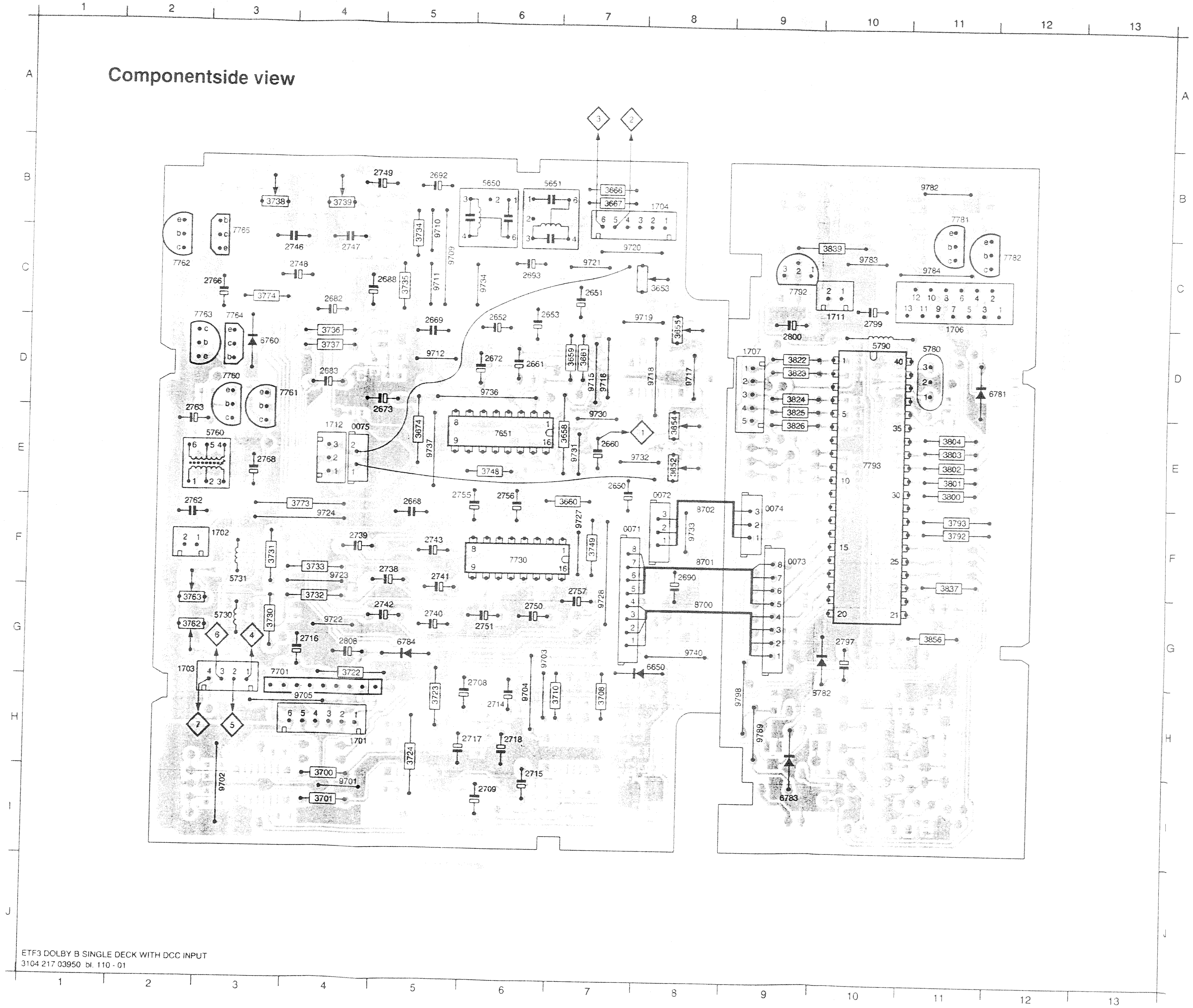
DOLBY B CONTROL PART SINGLE DECK WITH DCC INPUT


TAPE DECK CRF 4119 R/P
MECHANISM
R/P-DECK
MOTOR B DRIVE
SOL B DRIVE
7793
MC68HC05C4P
µ-CONTROLLER
3814
1M
5780
4 MHz
VPP
VCC
OSC1
OSC2
TAPE A
MODE A
CrO² A
SOL A
EOT A
MOTOR A
MOTOR B
REC FWD
RED RVS
TAPE B
MODE B
CrO² B
SOL B
EOT B
TCAP
GND
DACD
ACKCO
STRCD
RESET
IRQ
DA
STR
ACK
ATT
TCMP
PBCR
NS
A
REC
REC MUTE
HS
DOLBY C
DOLBY REC
DOLBY B
PB MUTE
1707
RESET
POWER DOWN
DSA DA
DSA STR
DSA ACK
Reset
Normal Operation
Power Down
During Communication Micro Processors
0073
-5C
-4.7V
PB CR
NS
A
REC
REC MUTE
REC CR
Ferro
CrO²
PLAY
REC
ON
OFF
0074
DOLBY MODE
DOLBY NR
PB MUTE
PLAY BACK MUTE
DOLBY B
DOLBY REC
1711
+12
GND MOTOR
7792
MC7805
3839
2800
100µ
5790
100µH
2799
100µ
7787
BC848C
3828
2797
6783
1N4148
6782
400 Hz
7781
BC328-40
7784
BC848C
7782
BC328-40
7785
BC848C
6781
1N4002
1706
COM
REC FWD
REC RVS
TAPE B
MODE B
CrO² B
GND
SOL B
EOT B
VCC B
REC-F
REC-R
TAPE
MODE
CrO²
SOLENOID
HALL EFFECT IC
OUT
MOTOR B
REC CR
3832
0E
2787
33n
/ PLAYBACK MODE + NORMAL SPEED
LEU0087
9432
ETF3 DOLBY B SINGLE DECK WITH DCC INPUT
3104 217 93950 bl 130 02

0073	F18
0074	J18
1706	H4
1707	C18
1711	L18
2787	J9
2791	D15
2792	D15
2793	D14
2794	E14
2795	E13
2796	G13
2797	G14
2799	N16
2800	M17
3786	G7
3787	K7
3789	G7
3790	K7
3792	G7
3793	K8
3795	L7
3800	I7
3801	L8
3802	I7
3803	J7
3804	J7
3805	I7
3806	B10
3807	C10
3808	C10
3809	H8
3810	H9
3811	H9
3812	H10
3813	H8
3814	A12
3816	C15
3817	C15
3818	C14
3819	C14
3820	C13
3822	C15
3823	D15
3824	D15
3825	E15
3826	E15
3827	G13
3828	G14
3829	H13
3830	H13
3831	H13
3832	J5
3833	K13
3836	K13
3837	K13
3839	M17
3842	B13
3844	B13
3856	E10
3857	C13
3866	E10
3867	D10
5780	A12
5790	M16
6781	K6
6782	G14
6783	G15
7781	F6
7782	K6
7784	G7
7785	L7
7787	G14
7792	M17
7793	F11

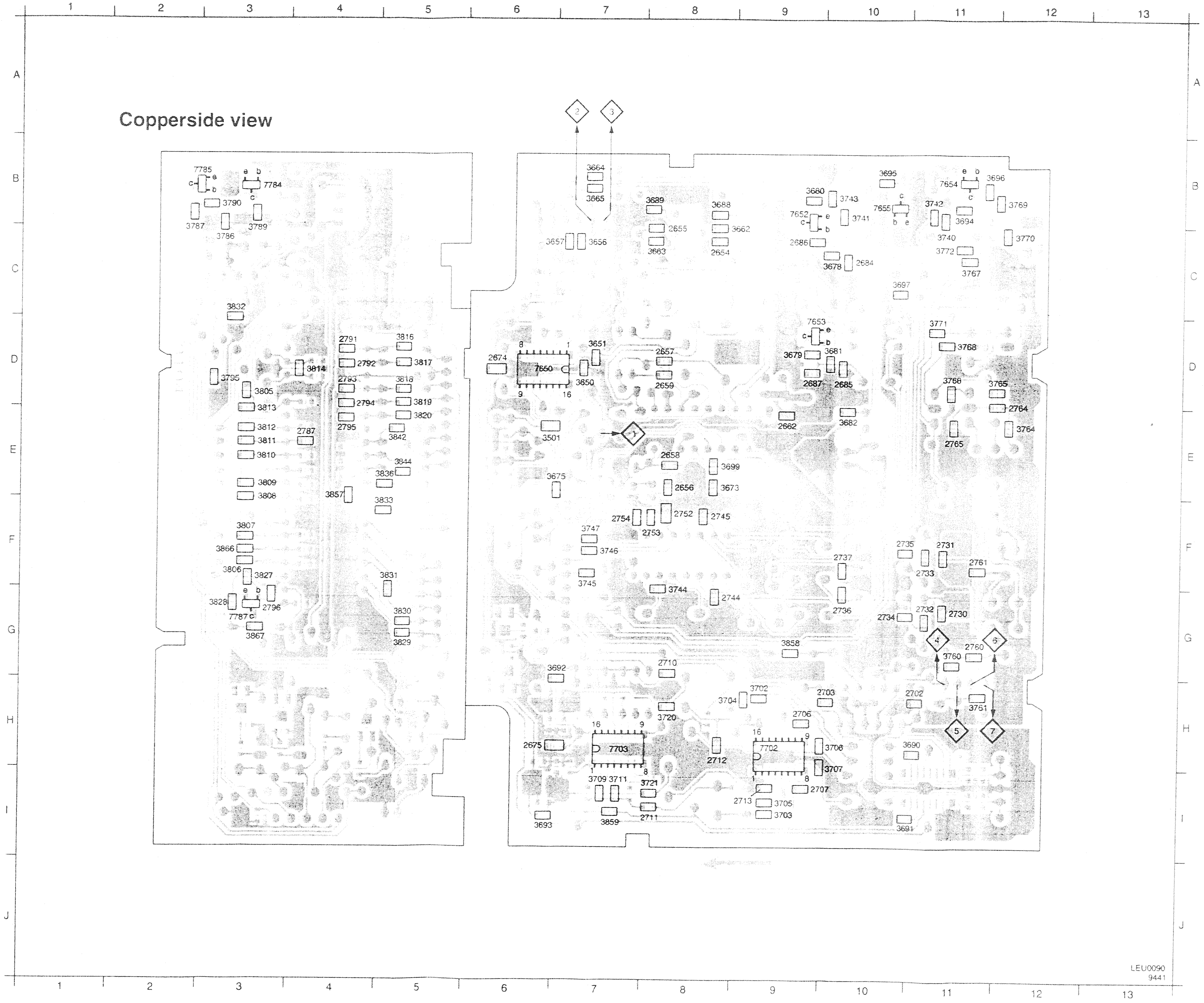
0071	F7	1707	D9	2669	D5	2709	I6	2742	G4	2757	G7	3653	C8	3700	I4	3733	F4	3763	G2	3822	D9	5730	G3	6784	G5	7781	B11	9704	H6	9719	C7	9732	E7	9798	H9
0072	E8	1711	C10	2672	D6	2714	H6	2743	F5	2762	F2	3654	E8	3701	I4	3734	C5	3773	F4	3823	D9	5731	F3	7651	E6	7782	C12	9705	H4	9720	C7	9733	F8		
0073	F9	1712	E4	2673	E4	2715	I6	2746	C3	2763	E2	3655	D8	3708	H7	3735	C5	3774	C3	3824	D9	5760	E3	7701	G3	7792	C9	9709	C5	9721	C7	9734	C6		
0074	F9	2650	E7	2682	C4	2716	G4	2747	C4	2766	C2	3658	E7	3710	H7	3736	D4	3792	F11	3825	D9	5780	D11	7730	F6	7793	E10	9710	C5	9722	G4	9736	D6		
0075	E4	2651	C7	2683	D4	2717	H6	2748	C3	2768	E3	3659	D7	3722	G4	3737	D4	3793	F11	3826	E9	5790	D10	7760	D3	8700	G8	9711	C5	9723	F4	9737	E5		
1701	H4	2652	C6	2688	C4	2718	H6	2749	B4	2797	G10	3660	F7	3723	H5	3738	B3	3800	E11	3837	F11	6650	G8	7761	D3	8701	F8	9712	D5	9724	F4	9740	G8		
1702	F3	2653	C6	2690	F8	2738	F5	2750	G6	2799	C10	3661	D7	3724	H5	3739	B4	3801	E11	3839	C10	6760	D3	7762	C2	8702	F8	9715	D7	9727	F7	9782	B11		
1703	G2	2660	E7	2692	B5	2739	F4	2751	G6	2800	D9	3666	B7	3730	G3	3748	E6	3802	E11	3856	G11	6781	D11	7763	D2	9701	I4	9716	D7	9728	G7	9783	C10		
1704	B8	2661	D6	2693	C6	2740	G5	2755	E5	2808	G4	3667	B7	3731	F3	3749	F7	3803	E11	5650	B6	6782	H9	7764	D3	9702	I3	9717	D8	9730	E7	9784	C11		
1706	D11	2668	F5	2708	H6	2741	F5	2756	E6	3652	E8	3674	E5	3732	G4	3762	G2	3804	E11	5651	B6	6783	I9	7765	C3	9703	G6	9718	D8	9731	E7	9789	H9		

Componentside view



ETF3 DOLBY B SINGLE DECK WITH DCC INPUT
3104 217 03950 bl. 110 - 01

2654	C8	2684	C10	2711	I8	2736	G10	2764	E12	3501	E6	3673	E8	3690	H10	3702	H9	3721	I8	3760	G11	3771	D11	3807	F3	3817	D5	3832	C3	3867	G3	7785	B2
2655	C8	2685	D10	2712	H8	2737	F10	2765	E11	3650	D7	3675	E6	3691	I10	3703	I9	3740	C11	3761	H11	3772	C11	3808	F3	3818	D5	3833	F4	7650	D6	7787	G3
2656	E8	2686	C9	2713	I9	2744	G8	2787	E4	3651	D7	3678	C9	3692	G6	3704	H8	3741	B10	3764	E12	3786	C3	3809	E3	3819	D5	3836	E4	7652	B9		
2657	D8	2687	D9	2730	G11	2745	F8	2791	D4	3656	C7	3679	D9	3693	I6	3705	I9	3742	B11	3765	D11	3787	C2	3810	E3	3820	E5	3842	E5	7653	D9		
2658	E8	2702	H10	2731	F11	2752	F8	2792	D4	3657	C6	3680	B9	3694	B11	3706	H10	3743	B10	3766	D11	3789	C3	3811	E3	3827	F3	3844	E5	7654	B11		
2659	D8	2703	H9	2732	G11	2753	F7	2793	D4	3662	C8	3681	D9	3695	B10	3707	I10	3744	G8	3767	C11	3790	B3	3812	E3	3828	G3	3857	F4	7655	B10		
2662	E9	2706	H9	2733	F11	2754	F7	2794	E4	3663	C8	3682	E10	3696	B11	3709	I7	3745	F7	3768	D11	3795	D3	3813	E3	3829	G5	3858	G9	7702	H9		
2674	D6	2707	I9	2734	G10	2760	G11	2795	E4	3664	B7	3688	B8	3697	C10	3711	I7	3746	F7	3769	B12	3805	D3	3814	D4	3830	G5	3859	I7	7703	H7		
2675	H6	2710	G8	2735	F10	2761	F11	2796	G3	3665	B7	3689	B7	3699	E8	3720	H8	3747	F7	3770	C12	3806	F3	3816	D5	3831	F5	3866	F3	7784	B3		


Copperside view
1
2
3
4
5
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10
11
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13
A
B
C
D
E
F
G
H
I
J
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7785
7784
3790
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3808
3857
3807
3866
3806
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7650
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3501
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3699
3675
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3673
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3858
2710
3692
3704
3702
3720
2675
7703
3709
3711
3721
3693
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2711
3680
3743
7652
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7655
3742
3694
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7653
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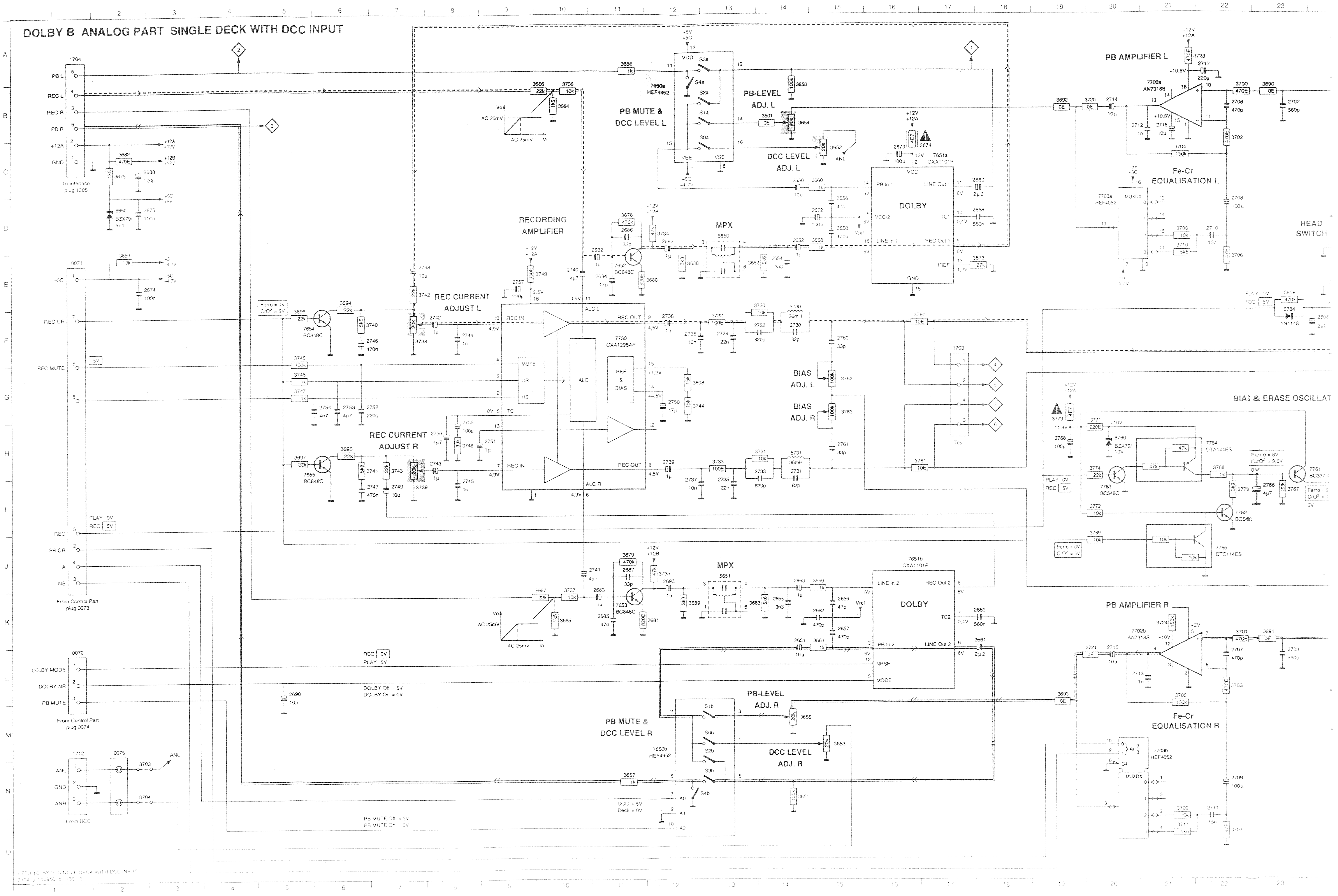
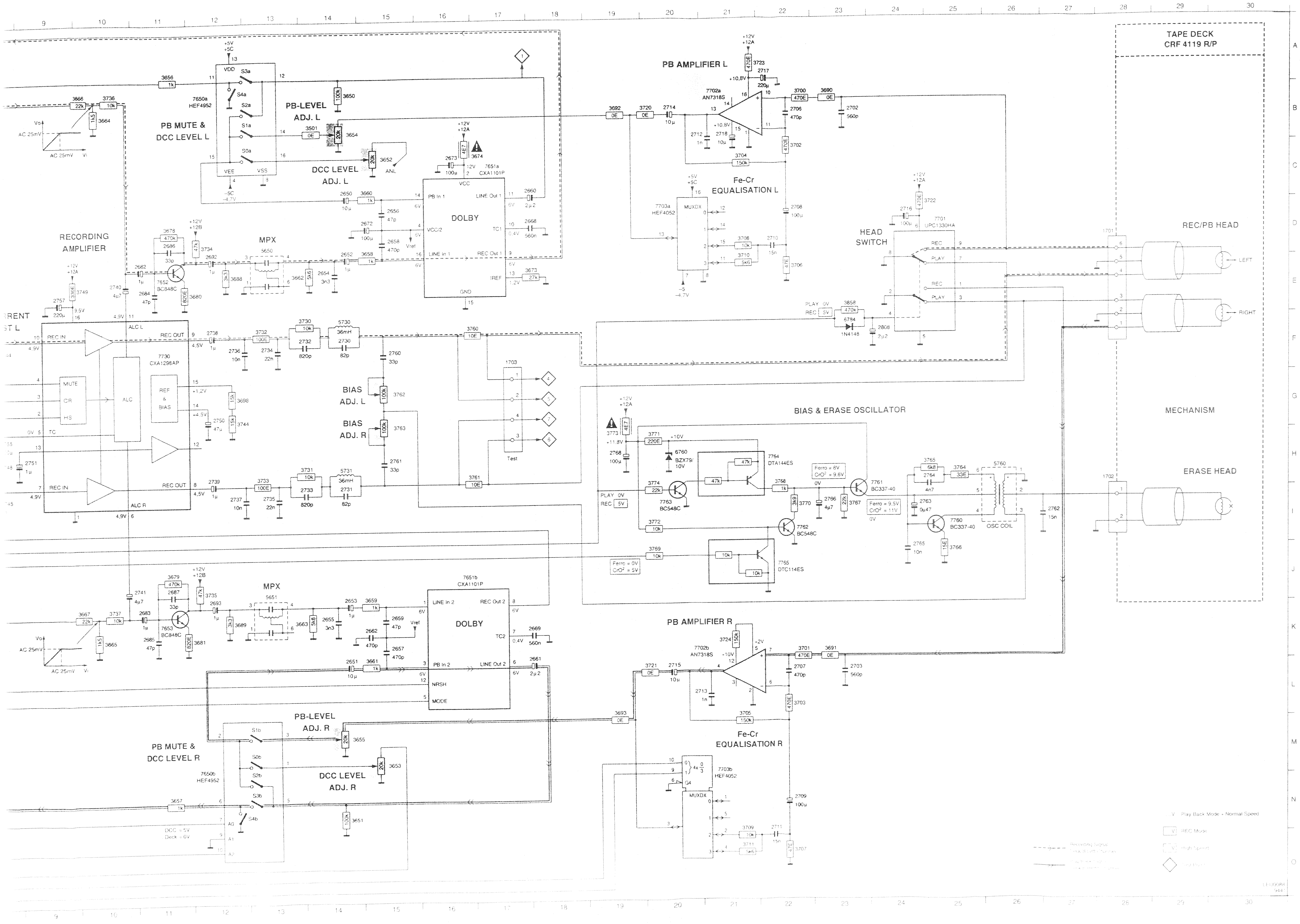
2760
3760
2703
2702
3761
2706
7702
3708
3707
2712
2707
2713
3705
3703
3690
3691
LEU0090
9441

DOLBY B ANALOG PART SINGLE DECK WITH DCC INPUT


1704
PB L
REC L
REC R
PB R
+12A
GND
To interface plug 1305
0071
-5C
REC CR
REC MUTE
REC
PB CR
A
NS
From Control Part plug 0073
0072
DOLBY MODE
DOLBY NR
PB MUTE
From Control Part plug 0074
1712
0075
ANL
GND
ANR
From DCC
8703
8704
Ferro = 0V
CrO² = 5V
PLAY 0V
REC 5V
RECORDING AMPLIFIER
REC CURRENT ADJUST L
REC CURRENT ADJUST R
7730
CXA1298AP
REC IN
REC OUT
ALC L
ALC R
MUTE
CR
HS
TC
ALC
REF & BIAS
7654
BC848C
7655
BC848C
7652
BC848C
7653
BC848C
MPX
5650
5651
PB MUTE & DCC LEVEL L
PB MUTE & DCC LEVEL R
7650a
HEF4952
7650b
HEF4952
VDD
VEE
VSS
S0a
S1a
S2a
S3a
S4a
S0b
S1b
S2b
S3b
S4b
A0
A1
A2
DCC = 5V
Deck = 0V
PB MUTE Off = 5V
PB MUTE On = 0V
PB-LEVEL ADJ. L
PB-LEVEL ADJ. R
DCC LEVEL ADJ. L
DCC LEVEL ADJ. R
DOLBY
7651a
CXA1101P
7651b
CXA1101P
PB In 1
LINE Out 1
LINE In 1
REC Out 1
VCC/2
TC1
TC2
IREF
GND
VCC
LINE In 2
REC Out 2
PB In 2
LINE Out 2
NRSH
MODE
Vref
REC 0V
PLAY 5V
DOLBY Off = 5V
DOLBY On = 0V
BIAS ADJ. L
BIAS ADJ. R
1703
Test
AC 25mV
Vo
Vi
PB AMPLIFIER L
PB AMPLIFIER R
7702a
AN7318S
7702b
AN7318S
Fe-Cr EQUALISATION L
Fe-Cr EQUALISATION R
7703a
HEF4052
7703b
HEF4052
MUXDX
HEAD SWITCH
BIAS & ERASE OSCILLAT
7764
DTA144ES
7763
BC548C
7762
BC548C
7761
BC337-
7765
DTC114ES
6760
BZX79/10V
6784
1N4148
6650
BZX79
5V1
Ferro = 8V
CrO² = 9.6V
Ferro = 0V
CrO² = 2V


TAPE DECK
CRF 4119 R/P
PB AMPLIFIER L
7702a
AN7318S
PB MUTE &
DCC LEVEL L
7650a
HEF4952
PB-LEVEL
ADJ. L
DCC LEVEL
ADJ. L
DOLBY
7651a
CXA1101P
RECORDING
AMPLIFIER
MPX
5650
Fe-Cr
EQUALISATION L
7703a
HEF4052
MUXDX
HEAD
SWITCH
7701
UPC1330HA
REC/PB HEAD
LEFT
RIGHT
7730
CXA1296AP
REC IN
REC OUT
ALC L
ALC R
MUTE
CR
HS
ALC
REF
&
BIAS
TC
BIAS
ADJ. L
BIAS
ADJ. R
Test
1703
BIAS & ERASE OSCILLATOR
MECHANISM
ERASE HEAD
7764
DTA144ES
7765
DTC114ES
7761
BC337-40
7760
BC337-40
7762
BC548C
7763
BC548C
6760
BZX79/
10V
OSC COIL
5760
Ferro = 8V
CrO² = 9.6V
Ferro = 9.5V
CrO² = 11V
Ferro = 0V
CrO² = 5V
PLAY 0V
REC 5V
6784
1N4148
PB AMPLIFIER R
7702b
AN7318S
Fe-Cr
EQUALISATION R
7703b
HEF4052
PB-LEVEL
ADJ. R
DCC LEVEL
ADJ. R
PB MUTE &
DCC LEVEL R
7650b
HEF4952
7651b
CXA1101P
5651
7652
BC848C
7653
BC848C
AC 25mV
Vo
Vi
DCC = 5V
Deck = 0V
V Play Back Mode + Normal Speed
V REC Mode
V High Speed
Recording Signal
LEU0088
9441

0071	E1	3695	H6
0072	L1	3696	F5
0075	M2	3697	H5
1701	D28	3698	G12
1702	H28	3700	B22
1703	F17	3701	K22
1704	A1	3702	C22
1712	M1	3703	L22
2650	C14	3704	C21
2651	K14	3705	L21
2652	D14	3706	E22
2653	J14	3707	O22
2654	E14	3708	D21
2655	K14	3709	N21
2656	D15	3710	D21
2657	K15	3711	O21
2658	D15	3720	B19
2659	K15	3721	L19
2660	C17	3722	D25
2661	K17	3723	A21
2662	K15	3724	K21
2668	D17	3730	F13
2669	K17	3731	H13
2672	D15	3732	F13
2673	C16	3733	H13
2674	E2	3734	D12
2675	D2	3735	J12
2682	E11	3736	B10
2683	K11	3737	K10
2684	E11	3738	F7
2685	K11	3739	I7
2686	D11	3740	F6
2687	J11	3741	H6
2688	C2	3742	E7
2690	L5	3743	H7
2692	D12	3744	G12
2693	J12	3745	F5
2702	B23	3746	G5
2703	L23	3747	G5
2706	B22	3748	H8
2707	L22	3749	E10
2708	D22	3760	F16
2709	N22	3761	H16
2710	D22	3762	G15
2711	N22	3763	G15
2712	B20	3764	H25
2713	L20	3765	H24
2714	B20	3766	J25
2715	L20	3767	I23
2716	D24	3768	H22
2717	A22	3769	J20
2718	B21	3770	I22
2730	F14	3771	H20
2731	H14	3772	I20
2732	F13	3773	H19
2733	H13	3774	H20
2734	F13	3858	E23
2735	I13	3859	E2
2736	F12	5650	D13
2737	I12	5651	J13
2738	F12	5730	F14
2739	H12	5731	H14
2740	E10	5760	H26
2741	J10	6650	D2
2742	F8	6760	H20
2743	H8	6784	F23
2744	F8	7650a	B12
2745	I8	7650b	M12
2746	F6	7651a	C17
2747	I6	7651b	J16
2748	E7	7652	E11
2749	I7	7653	K11
2750	G12	7654	F5
2751	H9	7655	H5
2752	G6	7701	D25
2753	G6	7702a	B21
2754	G6	7702b	K20
2755	H8	7703a	D20
2756	H8	7703b	M21
2757	E9	7730	F11
2760	F15	7760	I25
2761	H15	7761	H24
2762	I27	7762	I22
2763	I24	7763	I20
2764	H24	7764	H22
2765	J24	7765	J22
2766	I23	8703	N2
2768	H19	8704	N2
2808	F24		
3501	B14		
3650	B14		
3651	N14		
3652	C15		
3653	M15		
3654	B14		
3655	M14		
3656	A11		
3657	N11		
3658	D15		
3659	J15		
3660	C15		
3661	K15		
3662	E13		
3663	K13		
3664	B10		
3665	K10		
3666	B9		
3667	K9		
3673	E17		
3674	C17		
3675	C2		
3678	D11		
3679	J11		
3680	E12		
3681	K12		
3682	C2		
3688	E12		
3689	K12		
3690	B23		
3691	K23		
3692	B19		
3693	L19		
3694	E6		

0071	F6	2655	C7	2686	C9	2716	G10	2745	F8	2765	E11
0072	E6	2656	E7	2687	D9	2717	H8	2746	C10	2766	C11
0073	F5	2657	D8	2688	C9	2718	H8	2747	C10	2768	E11
0074	F5	2658	E8	2690	F6	2730	G11	2748	C10	2787	E4
0075	E10	2659	D8	2692	B9	2731	F11	2749	B9	2791	D4
1701	H11	2660	E7	2693	C8	2732	G11	2750	G8	2792	D4
1702	F11	2661	D8	2702	H11	2733	F11	2751	G8	2793	D4
1703	G12	2662	D9	2703	H9	2734	G10	2752	F8	2794	D4
1704	B6	2668	F9	2706	H9	2735	F10	2753	F7	2795	E4
1706	D3	2669	D9	2707	I9	2736	G10	2754	F7	2796	G3
1707	D5	2672	D8	2708	H8	2737	F10	2755	E8	2797	G4
1711	C4	2673	E9	2709	I8	2738	F9	2756	F8	2799	C4
1712	E10	2674	D6	2710	G8	2739	F10	2757	F7	2800	D4
2650	E7	2675	H6	2711	I7	2740	G9	2760	G11	2808	G10
2651	C7	2682	C10	2712	H8	2741	F9	2761	F11	3501	E6
2652	C8	2683	D10	2713	I8	2742	G9	2762	F11	3650	D7
2653	C7	2684	C10	2714	H8	2743	F9	2763	E12	3651	D7
2654	C8	2685	D10	2715	I8	2744	G8	2764	D12	3652	E6

3653	C6	3678	C9	3702	H9	3733	F10	3761	H11	3792	F3
3654	E6	3679	D9	3703	I9	3734	C9	3762	G11	3793	F3
3655	D6	3680	B9	3704	H9	3735	C9	3763	G11	3795	D2
3656	C7	3681	D9	3705	I9	3736	D10	3764	E12	3800	E2
3657	C6	3682	D10	3706	H10	3737	D10	3765	D11	3801	E3
3658	E7	3688	B8	3707	H10	3738	B11	3766	D11	3802	E2
3659	D7	3689	B7	3708	H7	3739	B10	3767	C11	3803	E2
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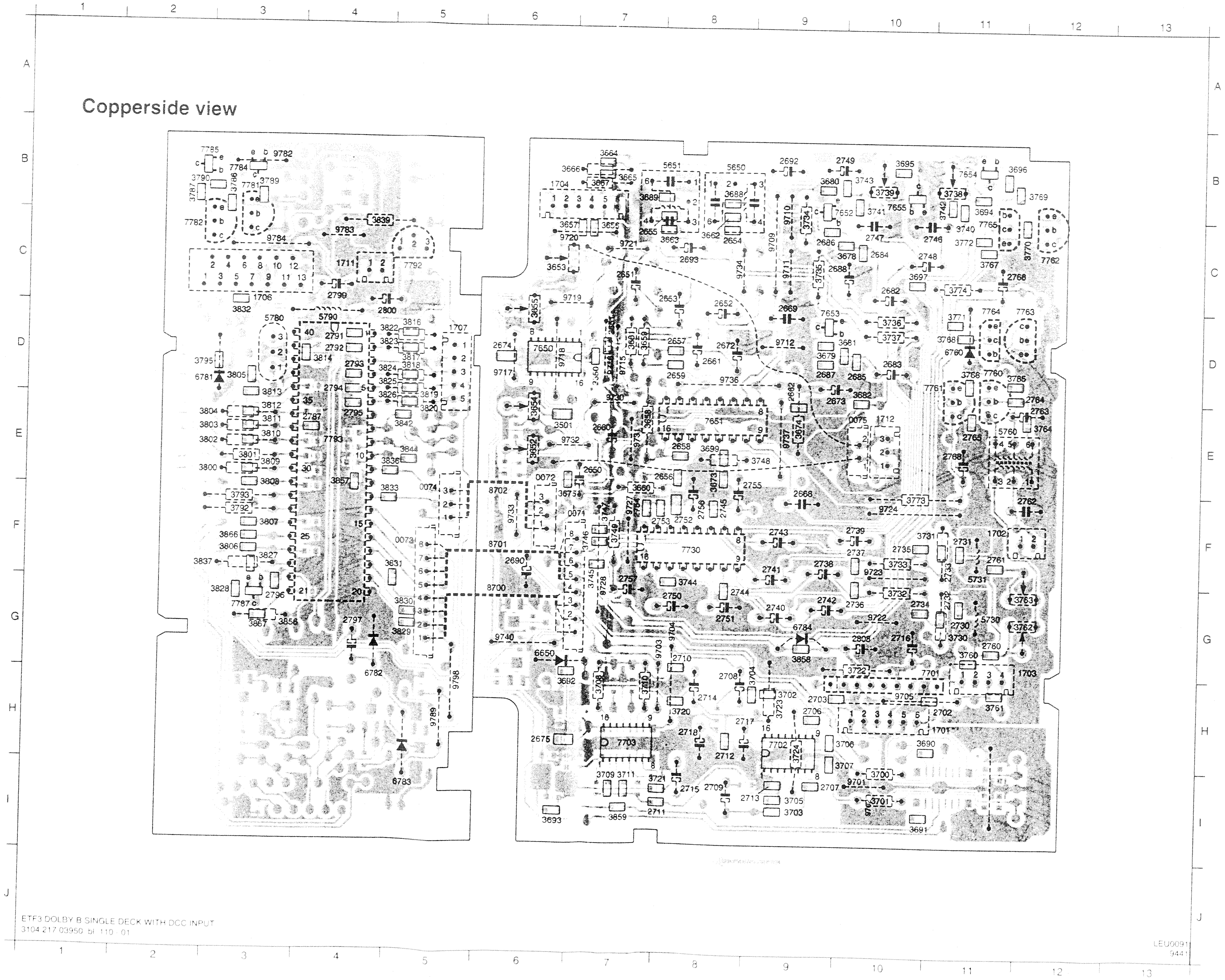
3663	C7	3693	I6	3720	H8	3743	B10	3771	D11	3807	F3
3664	B7	3694	B11	3721	I7	3744	G8	3772	C11	3808	F3
3665	B7	3695	B10	3722	G10	3745	G7	3773	F10	3809	E3
3666	B6	3696	B11	3723	H9	3746	F7	3774	C11	3810	E3
3667	B7	3697	C10	3724	H9	3747	F7	3786	B3	3811	E3
3673	E8	3699	E8	3730	G11	3748	E9	3787	B2	3812	E3
3674	E9	3700	I10	3731	F10	3749	F7	3789	B3	3813	E3
3675	F6	3701	I10	3732	G10	3760	G11	3790	B2	3814	D4

3816	D5	3837	F2	6760	D11	7763	C11	9709	C9	9732	E6
3817	D5	3839	C4	6781	D2	7764	C11	9710	C9	9733	F6
3818	D5	3842	E5	6782	H4	7765	C11	9711	C9	9734	C8
3819	E5	3844	E5	6783	I5	7781	B3	9712	D9	9736	D8
3820	E5	3856	G3	6784	G9	7782	C2	9715	D7	9737	E9
3822	D4	3857	E4	7650	D6	7784	B3	9716	D7	9740	G6
3823	D4	3858	G9	7651	E8	7785	B2	9717	D6	9782	B3
3824	D4	3859	I7	7652	B9	7787	G3	9718	D6	9783	C4
3825	D4	3866	F3	7653	D9	7792	C5	9719	C6	9784	C3
3826	E4	3867	G3	7654	B11	7793	E4	9720	C6	9789	H5
3827	F3	5650	B8	7655	B10	8700	G6	9721	C7	9798	H5
3828	G3	5651	B7	7701	G10	8701	F6	9722	G10		
3829	G5	5730	G11	7702	H9	8702	F6	9723	F10		
3830	G5	5731	F11	7703	H7	9701	I10	9724	F10		
3831	F4	5760	E11	7730	F8	9702	I10	9727	F7		
3832	D3	5780	D3	7760	D11	9703	G8	9728	G7		
3833	F4	5790	D4	7761	D10	9704	G8	9730	E7		
3836	E4	6650	G6	7762	C12	9705	H10	9731	E7		

Copperside view



ETF3 DOLBY B SINGLE DECK WITH DCC INPUT
3104 217 03950 bl 110 - 01

LEU0091
9441

ELECTRICAL MAESUREMENTS AND ADJUSTMENTS SINGLE DECK DCC INPUT

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP **2**	Wow and Flutter meter	check	< 0,3%	
DCC Playback Dolby Level	Dolby 200 N.Wb/m	DCC in Play	TP **2** left ch TP **3** right ch	AC mV meter	3652 3653	548mV ±0,5dB	see #1
Deck Playback DolbyLevel	Dolby 200 N.Wb/m	Play in forward direction	TP **2** left ch TP **3** right ch	AC mV meter	3654 3655	548mV ±0,5dB	
Deck Azimuth	SBC 419 12kHz	Play in forward direction	TP **2** left ch or TP **3** right ch	AC mV meter	Left screw Norm.Dir.(>)	max. output left=right	
		Play in reverce direction			Right screw Rev.Dir.(<)		
Bias current Chrome	-	Record mode and Chrome mode	TP **4** **5** L.ch	AC mV meter	3762	7 mV	see #2
			TP **6** **7** R.ch		3763		
Bias current Ferro	-	Record mode and Ferro mode	TP **4** **5** L.ch	AC mV meter	check	4,4mV ±0,5dB	
			TP **6** **7** R.ch		check		
Recording current	Dolby 200N Wb/m (in DCC) and Chrome.cass (deck)	DCC dubbing mode and Chrome mode	TP **4** **5** L.ch	AC mV meter	3738	0,68mV	Filter out osc with audio filter see also #3
			TP **6** **7** R.ch		3739	Rec/PB Level within ±1 dB of 548 mV	
	Dolby 200N Wb/m (in DCC) and Ferro.cass (deck)	Dubbing mode and Ferro mode	TP **4** **5** L.ch		check	0,45mV	
			TP **6** **7** R.ch		check	Rec/PB Level within ±1 dB of 548 mV	
Multiplex Filter		Record mode Inject 19kHz at line in	TP **2** left ch. TP **3** right ch	AC mV meter	5650 5651	Min. output Typ. Attenuation >40dB Min. Attenuation >30dB	
Oscillator Frequency		Record mode	TP **4** **5** L.ch	Counter	5760	88kHz ±6kHz	

#1 Dolby level to be tested in reverse direction within same tolerance.

#2 Bias current must be aligned for Chrome position

#3 Recording current should be aligned using an iterative method. Perform a dubbing using test tape Dolby 200 N. Wb/m as source, and Ferro tape or Chrome tape as target blank tapes. Checkt that the output t.p. gives 548 mV during dubbing. Then playback the recorded tape. The record/playback level should also be 548 mV ± 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.

Dismantling hints CD Short Loader

Dismantling the tray

a) Press open/close button to open the tray. If the tray doesn´t work, use a small screwdriver as shown in Fig.1 point 1 to move the tray outside. After the first centimetre it is possible to pull the tray out by hand. (See also chapter 3-2 Dismantling the Front of CD Tray)

b) Release two snaps and remove tray.

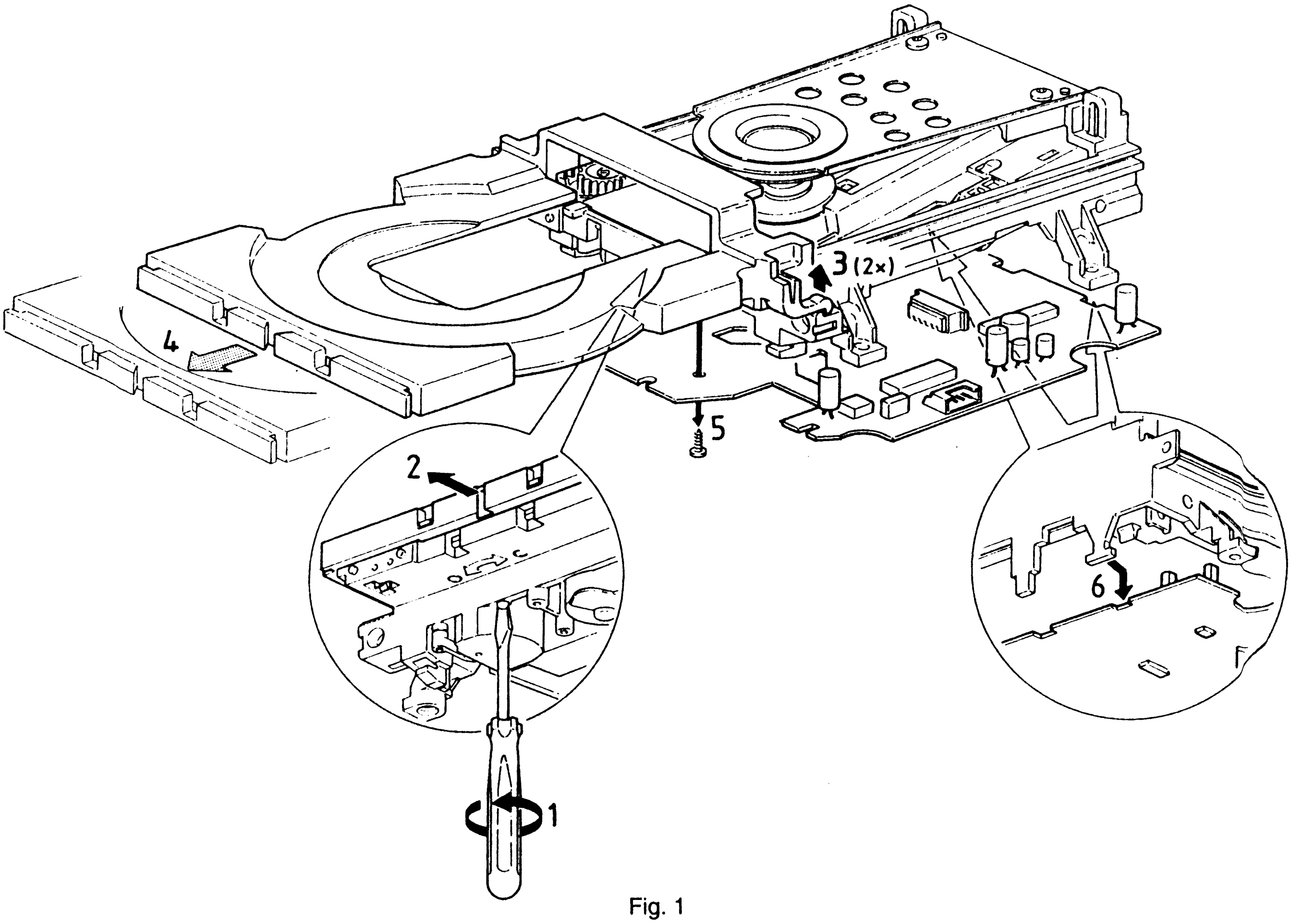


Fig. 1

Assembly of gear

a) Use a pin (e.g. a paperclip) to align the cam wheel (a) withthe gear wheel (b). See Fig. 2.

b) Fix the wheels with the small plastic whashers.

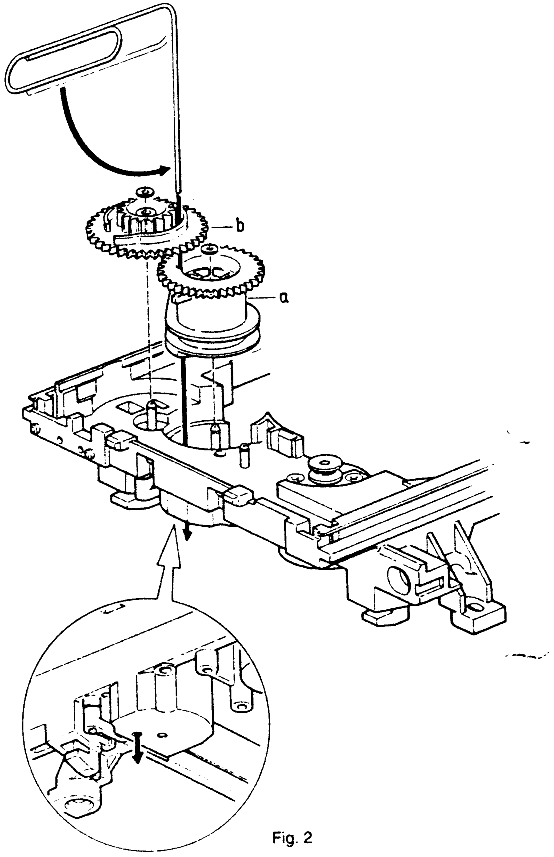
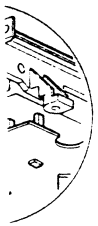


Fig. 2



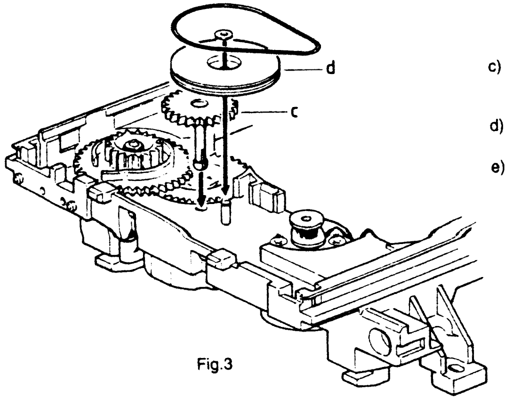


Fig.3

c) Mount idle wheel 2 (c) and idle wheel 1 (d) in any position. See Fig. 3.

d) Fix the idle wheel 1 (d) with the small plastic whasher.

e) Mount the driving belt.

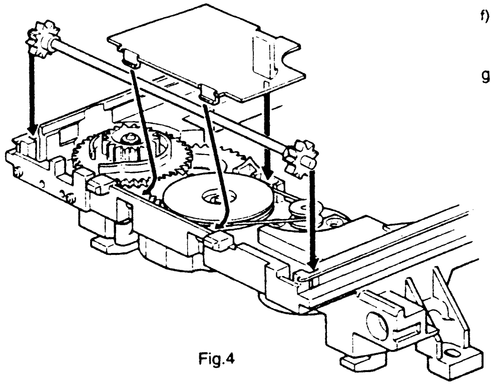


Fig.4

f) Mount the pinion guiding assy and the cover as shown in Fig. 4.

g) Turn the gear wheel (b) counter clockwise to endposition.

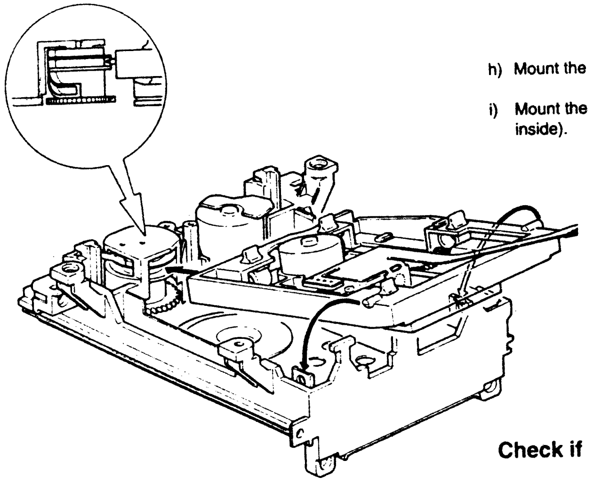


Fig.5

h) Mount the CD Mechanism as shown in Fig. 5.

i) Mount the tray (Align the tray to the chassis and push it inside).

Check if tray mechanism works correctly!

1) Turn the gear wheel (b) clockwise to its endposition (Use a small screwdriver as shown in Fig. 1 point 1).

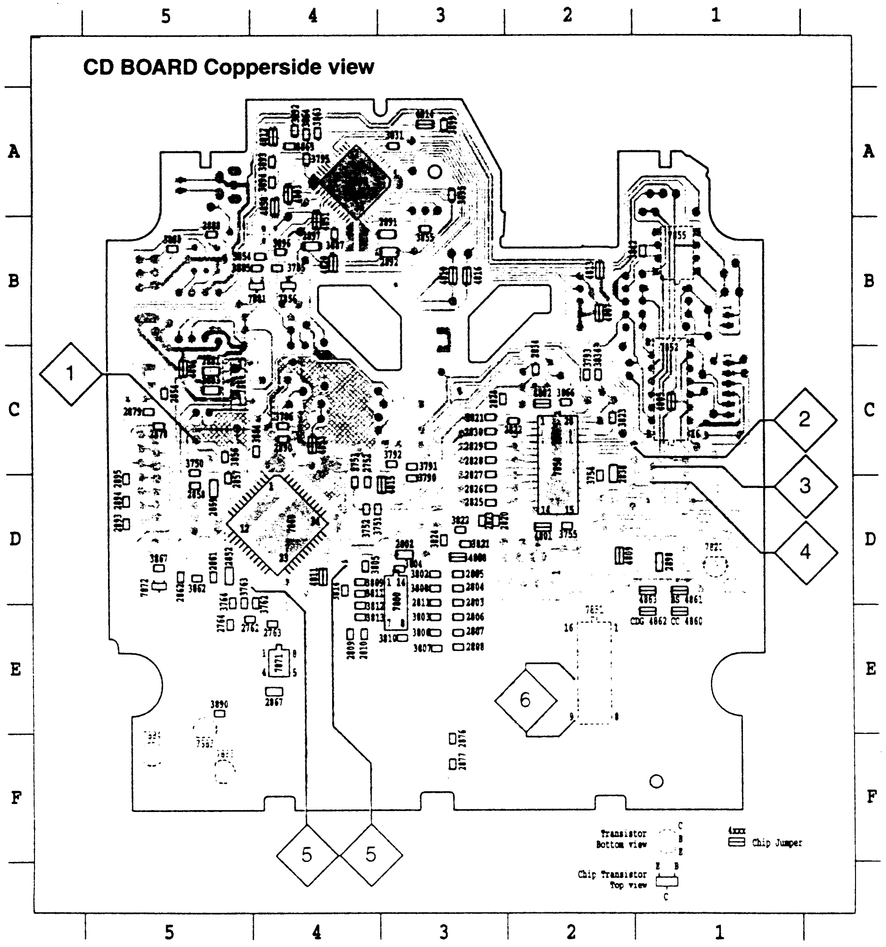
   The tray has to move to inner position first and then the CD mechanism has to move to its upper position.

2) Turn the gear wheel (b) counter clockwise to its endposition.

   The CD Mechanism has to move to its lower position first and then the tray has to move outside.

MP1 C 5	2806 E 3	2823 D 3	2852 D 5	2879 C 5	2895 D 5	3763 D 5	3802 D 3	3812 E 4	3854 B 4	3884 C 4	3897 B 4	4810 B 3	4851 B 4	7880 F 2
2752 D 4	2807 E 3	2825 D 3	2854 C 5	2881 C 5	2897 B 4	3764 D 5	3803 E 3	3813 E 4	3855 B 3	3885 B 4	3899 A 3	4811 D 4	4860 E 1	7871 E 4
2753 D 4	2808 E 3	2826 D 3	2857 D 5	2883 C 5	2898 D 1	3785 B 4	3804 D 3	3814 D 4	3856 C 5	3887 B 4	4801 D 2	4812 A 4	4861 D 1	7872 D 5
2762 E 5	2809 E 4	2827 D 3	2858 D 5	2888 B 5	3750 C 5	3790 D 3	3805 D 4	3821 D 3	3862 D 5	3888 B 5	4802 C 2	4813 B 2	4862 E 1	7881 B 4
2763 E 4	2810 E 4	2828 C 3	2861 D 5	2890 C 4	3751 D 4	3791 C 3	3806 E 3	3822 D 3	3863 A 4	3892 A 4	4803 A 4	4814 A 3	4863 D 1	7890 A 4
2764 E 5	2811 D 3	2829 C 3	2862 D 5	2891 B 3	3752 D 4	3792 C 3	3807 E 3	3823 C 2	3864 A 4	3893 A 4	4805 C 1	4815 D 3	7800 D 3	
2802 D 3	2820 D 3	2830 C 3	2876 F 3	2892 B 3	3754 D 2	3793 C 2	3809 D 4	3824 D 3	3865 A 4	3894 A 4	4806 C 5	4816 B 3	7850 C 2	
2804 D 3	2821 C 3	2834 C 2	2877 F 3	2893 D 5	3755 D 2	3794 B 4	3810 E 3	3831 A 3	3866 C 2	3895 A 3	4808 D 3	4820 B 4	7856 B 4	
2805 D 3	2822 C 2	2838 C 2	2878 C 5	2894 D 5	3762 D 4	3795 A 4	3811 D 4	3834 C 2	3867 D 5	3896 B 4	4809 D 2	4850 A 4	7860 D 4	

CD BOARD Copperside view



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2866 E 5	1880 B 5	2839 E 1	2856 C 5	3760 B 2	3826 D 3	3837 E 1	3847 F 2	3860 C 5	3877 F 3	5890 A 3	7884 F 5	9010 D 3	9030 B 5	9044 C 3	9890 F 1
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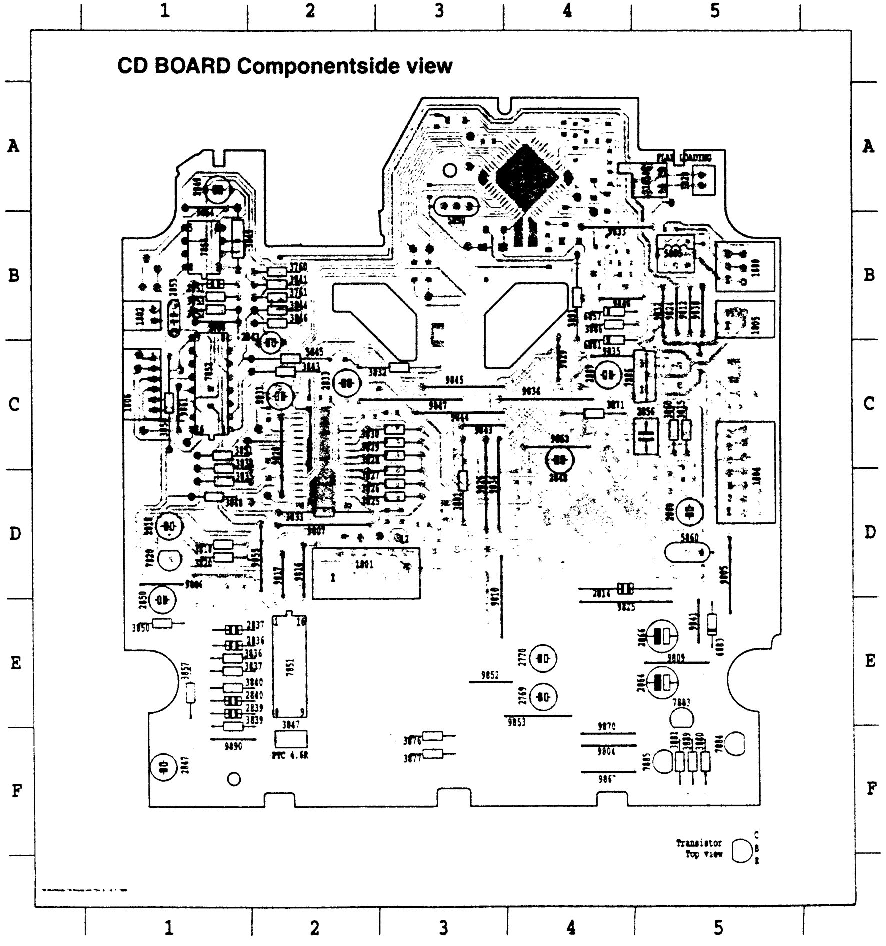
1801 D 2	2770 E 4	2843 C 2	2870 E 3	3767 F 4	3828 C 3	3839 E 1	3849 B 1	3870 E 3	3881 F 5	6881 C 4	7886 C 5	9016 D 2	9033 B 4	9047 C 3	
1802 B 1	2814 D 4	2847 F 1	2872 E 3	3770 F 4	3829 C 3	3840 E 1	3850 E 1	3871 C 4	3886 B 4	6883 E 5	9004 F 4	9017 D 2	9034 C 4	9052 E 3	
1804 D 5	2818 D 1	2848 C 4	2873 F 2	3801 D 3	3830 C 3	3841 B 2	3851 C 1	3872 F 3	3889 F 5	7820 D 1	9005 D 5	9024 B 5	9035 C 4	9053 E 4	
1805 B 5	2831 C 2	2849 A 1	2874 E 3	3815 C 5	3832 C 3	3843 C 2	3852 B 1	3873 F 3	3891 B 4	7851 E 2	9006 D 1	9025 E 4	9036 D 3	9054 A 1	
1806 C 1	2833 C 2	2850 E 1	2875 F 4	3818 D 1	3833 D 2	3844 B 2	3853 B 1	3874 E 3	3898 F 3	7852 C 1	9007 D 2	9026 D 3	9040 B 4	9055 D 2	
1810 A 5	2836 E 1	2851 B 1	2885 F 3	3820 D 1	3835 D 1	3845 C 2	3857 E 1	3875 F 2	5860 D 5	7855 B 1	9008 B 1	9028 C 2	9041 E 5	9061 C 1	

CD BOARD Componentside view



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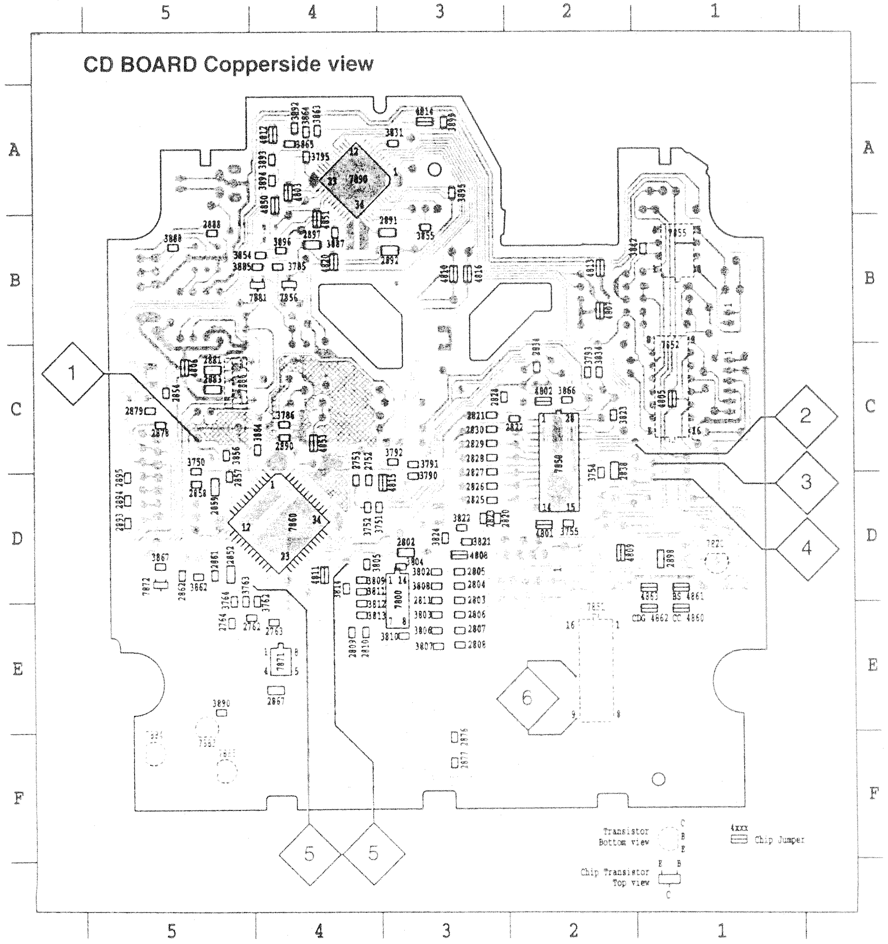
2752 D 4	2807 E 3	2825 D 3	2854 C 5	2881 C 5	2897 B 4	3764 D 5	3803 E 3	3813 E 4	3855 B 3	3885 B 4	3899 A 3	4811 D 4	4860 E 1	7871 E 4
2753 D 4	2808 E 3	2826 D 3	2857 D 5	2883 C 5	2898 D 1	3785 B 4	3804 D 3	3814 D 4	3856 C 5	3887 B 4	4801 D 2	4812 A 4	4861 D 1	7872 D 5
2762 E 5	2809 E 4	2827 D 3	2858 D 5	2888 B 5	3750 C 5	3790 D 3	3805 D 4	3821 D 3	3862 D 5	3888 B 5	4802 C 2	4813 B 2	4862 E 1	7881 B 4
2763 E 4	2810 E 4	2828 C 3	2861 D 5	2890 C 4	3751 D 4	3791 C 3	3806 E 3	3822 D 3	3863 A 4	3892 A 4	4803 A 4	4814 A 3	4863 D 1	7890 A 4
2764 E 5	2811 D 3	2829 C 3	2862 D 5	2891 B 3	3752 D 4	3792 C 3	3807 E 3	3823 C 2	3864 A 4	3893 A 4	4805 C 1	4815 D 3	7800 D 3	
2802 D 3	2820 D 3	2830 C 3	2876 F 3	2892 B 3	3754 D 2	3793 C 2	3809 D 4	3824 D 3	3865 A 4	3894 A 4	4806 C 5	4816 B 3	7850 C 2	
2804 D 3	2821 C 3	2834 C 2	2877 F 3	2893 D 5	3755 D 2	3794 B 4	3810 E 3	3831 A 3	3866 C 2	3895 A 3	4808 D 3	4820 B 4	7856 B 4	
2805 D 3	2822 C 2	2838 C 2	2878 C 5	2894 D 5	3762 D 4	3795 A 4	3811 D 4	3834 C 2	3867 D 5	3896 B 4	4809 D 2	4850 A 4	7860 D 4	

CD BOARD Copperside view



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2866 E 5	1880 B 5	2839 E 1	2856 C 5	3760 B 2	3826 D 3	3837 E 1	3847 F 2	3860 C 5	3877 F 3	5890 A 3	7884 F 5	9810 D 3	9830 B 5	9844 C 3	9890 F 1
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1801 D 2	2770 E 4	2843 C 2	2870 E 3	3767 F 4	3828 C 3	3839 E 1	3849 B 1	3870 E 3	3881 F 5	6881 C 4	7886 C 5	9816 D 2	9833 B 4	9847 C 3	
1802 B 1	2814 D 4	2847 F 1	2872 E 3	3770 F 4	3829 C 3	3840 E 1	3850 E 1	3871 C 4	3886 B 4	6883 E 5	9804 F 4	9817 D 2	9834 C 4	9852 E 3	
1804 D 5	2818 D 1	2848 C 4	2873 F 2	3801 D 3	3830 C 3	3841 B 2	3851 C 1	3872 F 3	3889 F 5	7820 D 1	9805 D 5	9824 B 5	9835 C 4	9853 E 4	
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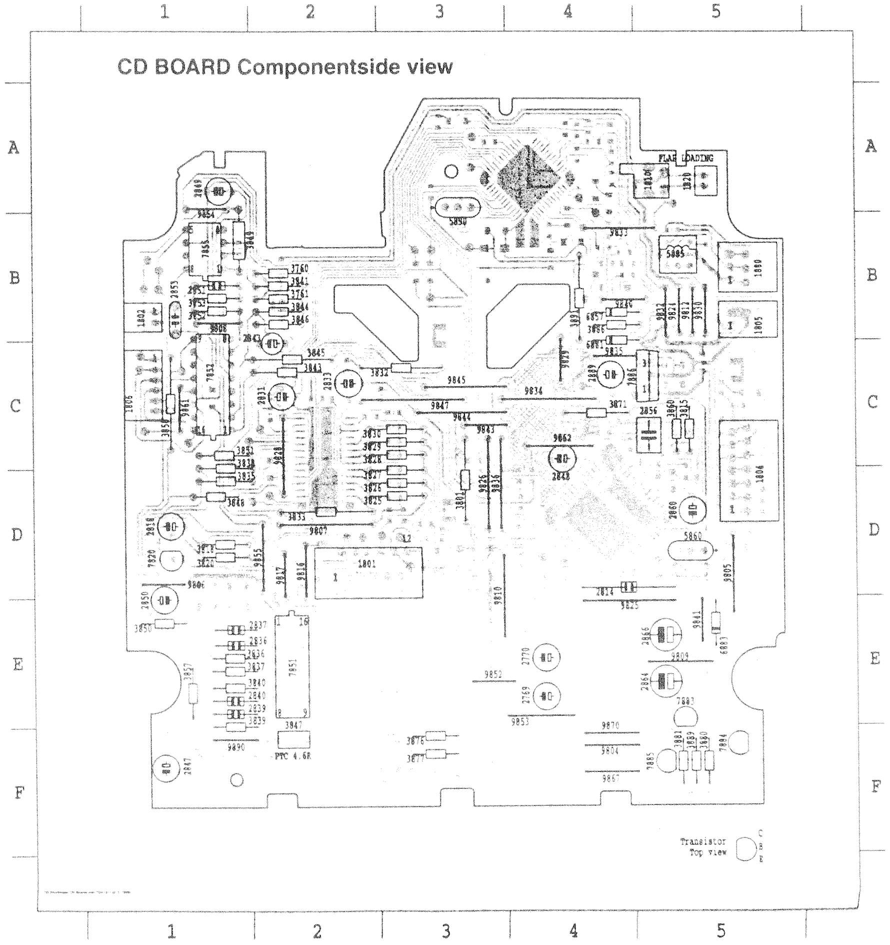
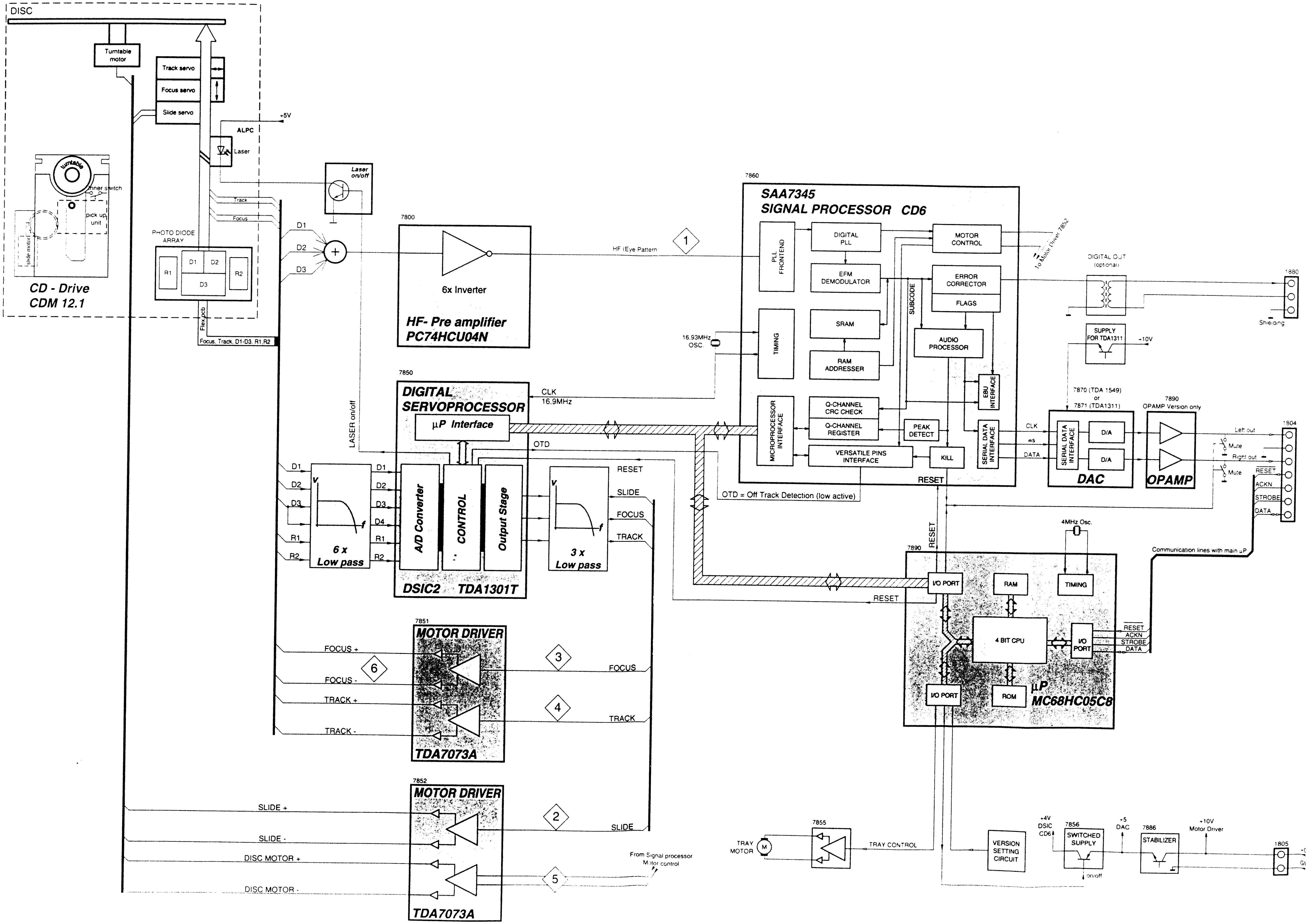
CD BOARD Componentside view



FUNCTIONAL DIAGRAM *CD Module*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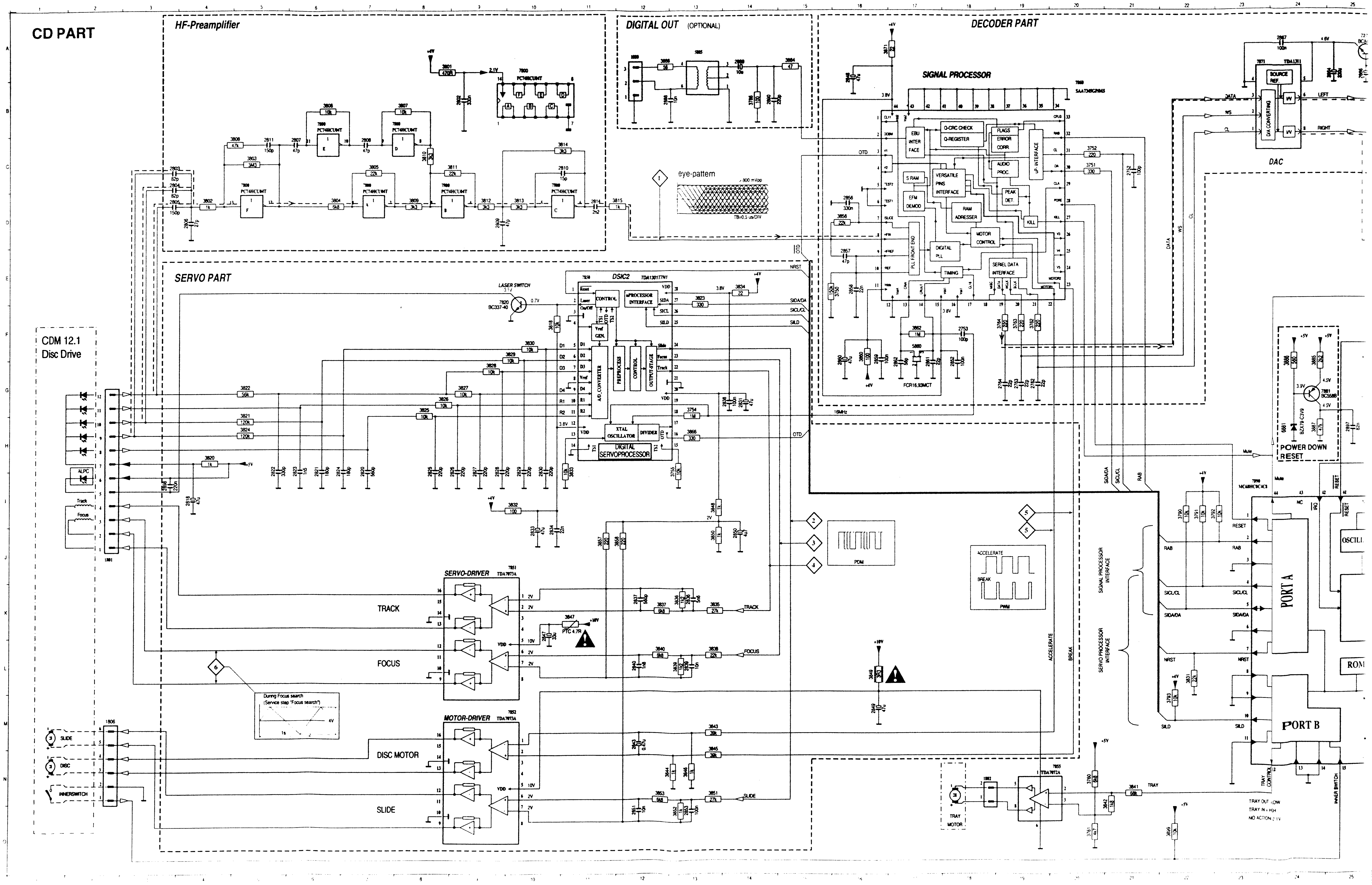
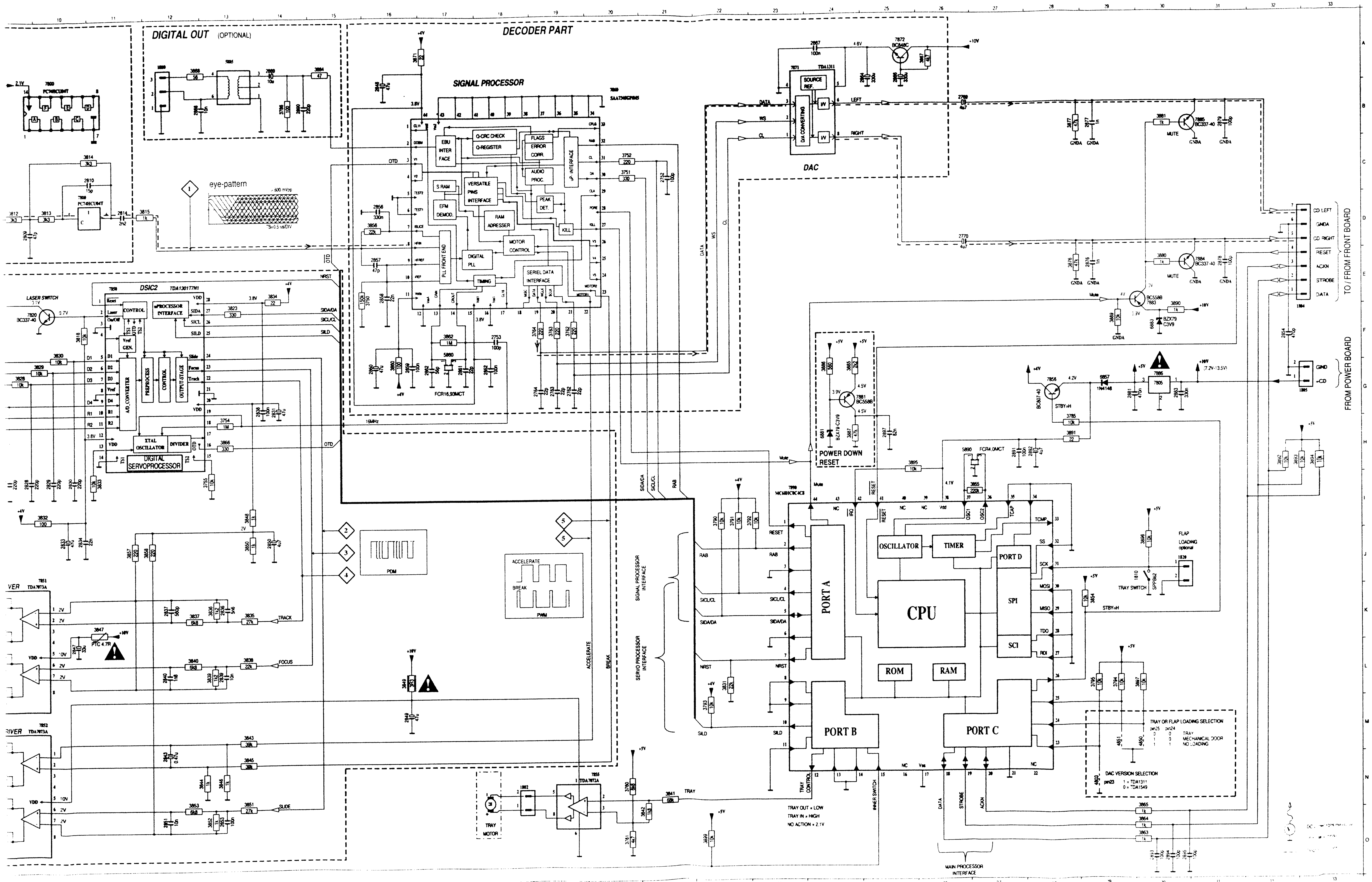
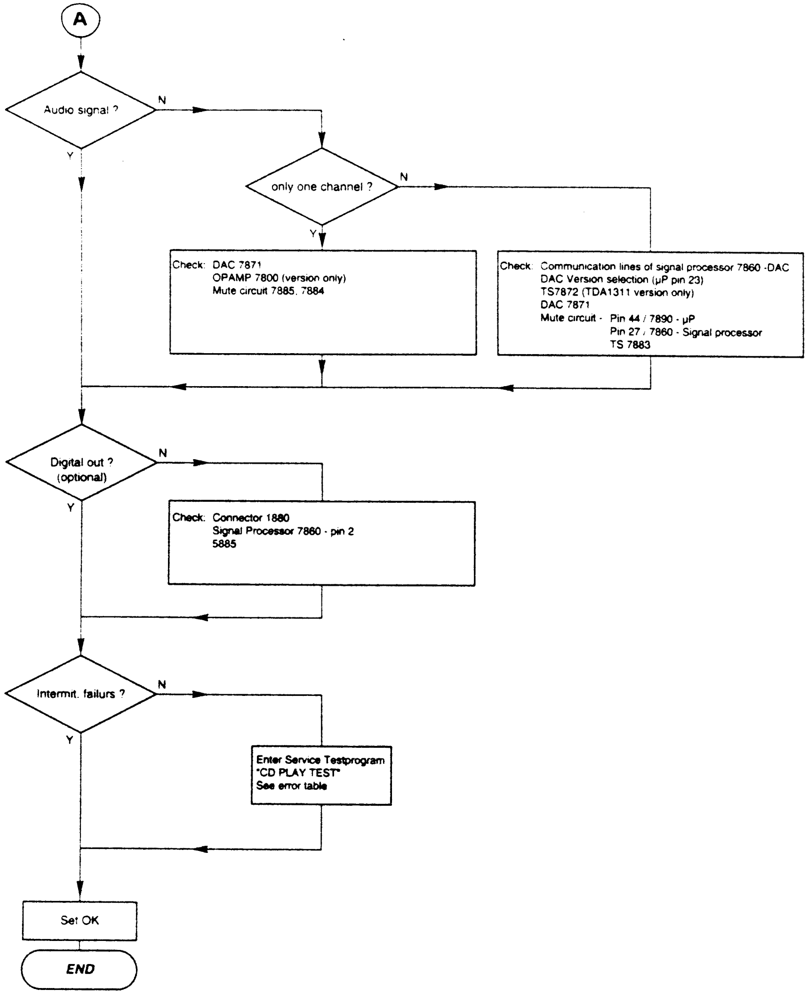
Turntable motor
Track servo
Focus servo
Slide servo
+5V
ALPC
Laser
turntable
inner switch
pick up unit
slide motor
PHOTO DIODE ARRAY
D1
D2
D3
R1
R2
CD - Drive
CDM 12.1
Flex pcb
Focus, Track, D1-D3, R1,R2
Track
Focus
Laser on/off
7800
6x Inverter
HF- Pre amplifier
PC74HCU04N
HF (Eye Pattern
1
7850
DIGITAL SERVOPROCESSOR
µP Interface
CLK 16.9MHz
OTD
LASER on/off
D4
6 x Low pass
A/D Converter
CONTROL
Output Stage
DSIC2 TDA1301T
3 x Low pass
RESET
SLIDE
FOCUS
TRACK
7860
SAA7345
SIGNAL PROCESSOR CD6
PLL FRONTEND
DIGITAL PLL
MOTOR CONTROL
EFM DEMODULATOR
ERROR CORRECTOR
FLAGS
SUBCODE
TIMING
SRAM
RAM ADDRESSER
AUDIO PROCESSOR
16.93MHz OSC.
MICROPROCESSOR INTERFACE
Q-CHANNEL CRC CHECK
Q-CHANNEL REGISTER
VERSATILE PINS INTERFACE
PEAK DETECT
KILL
EBU INTERFACE
SERIAL DATA INTERFACE
RESET
OTD = Off Track Detection (low active)
To Motor Driver 7852
DIGITAL OUT (optional)
1880
Shielding
SUPPLY FOR TDA1311
+10V
7870 (TDA 1549) or 7871 (TDA1311)
7890 OPAMP Version only
CLK
WS
DATA
SERIAL DATA INTERFACE
D/A
DAC
OPAMP
1804
Left out
Mute
Right out
RESET
ACKN
STROBE
DATA
4MHz Osc.
Communication lines with main µP
7890
RESET
I/O PORT
RAM
TIMING
4 BIT CPU
ROM
µP MC68HC05C8
7851
MOTOR DRIVER
TDA7073A
FOCUS +
FOCUS -
TRACK +
TRACK -
6
3
4
FOCUS
TRACK
7852
MOTOR DRIVER
TDA7073A
SLIDE +
SLIDE -
DISC MOTOR +
DISC MOTOR -
2
5
SLIDE
From Signal processor Motor control
7855
TRAY MOTOR
M
TRAY CONTROL
VERSION SETTING CIRCUIT
+4V DSIC CD6
7856
SWITCHED SUPPLY
on/off
+5 DAC
7886
STABILIZER
+10V Motor Driver
1805
+
GND

CD PART


HF-Preamplifier
DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
SAA7345GP/M45
DAC
TDA1311
SOURCE REF.
D/A CONVERTING
LEFT
RIGHT
DATA
WS
CL
eye-pattern
> 800 mVpp
TB=0.5 us/DIV
SERVO PART
LASER SWITCH
BC337-40
DSIC2
TDA1301T/N1
CONTROL
µPROCESSOR INTERFACE
Vref GEN.
A/D_CONVERTER
PREPROCESS
CONTROL
OUTPUT-STAGE
XTAL OSCILLATOR
DIVIDER
DIGITAL SERVOPROCESSOR
CDM 12.1 Disc Drive
ALPC
Track
Focus
SERVO-DRIVER
TDA7073A
TRACK
FOCUS
PTC 4.7R
MOTOR-DRIVER
TDA7073A
DISC MOTOR
SLIDE
DISC
INNERSWITCH
During Focus search (Service step "Focus search")
PDM
ACCELERATE
BREAK
PWM
EBU INTERFACE
Q-CRC CHECK
Q-REGISTER
FLAGS ERROR CORR
AUDIO PROC.
µP INTERFACE
S RAM
VERSATILE PINS INTERFACE
EFM DEMOD
RAM ADRESSER
PEAK DET
KILL
MOTOR CONTROL
PLL FRONT END
DIGITAL PLL
TIMING
SERIEL DATA INTERFACE
FCR16.93MCT
16MHz
SIDA/DA
SICL/CL
SILD
NRST
OTD
RAB
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
POWER DOWN RESET
BC558B
BZX79-C3V9
MC68HC6C4C1
PORT A
PORT B
OSCILL
ROM
RESET
Mute
TRAY MOTOR
TDA7072A
TRAY
TRAY CONTROL
INNER SWITCH
TRAY OUT: LOW
TRAY IN: HIGH
NO ACTION: 2.1V


DIGITAL OUT (OPTIONAL)
DECODER PART
SIGNAL PROCESSOR
SAA7345GP/M5
EBU INTER FACE
Q-CRC CHECK
Q-REGISTER
FLAGS
ERROR CORR.
µP INTERFACE
AUDIO PROC.
S RAM
VERSATILE PINS INTERFACE
PEAK DET.
EFM DEMOD.
RAM ADRESSER
KILL
MOTOR CONTROL
PLL FRONT END
DIGITAL PLL
SERIEL DATA INTERFACE
TIMING
FCR16,93MCT
DAC
TDA1311
SOURCE REF.
DA CONVERTING
DATA
WS
CL
LEFT
RIGHT
BC848C
eye-pattern
DSIC2
TDA1301T7H1
CONTROL
µPROCESSOR INTERFACE
A/D CONVERTER
PREPROCESS
CONTROL
OUTPUT STAGE
XTAL OSCILLATOR
DIVIDER
DIGITAL SERVOPROCESSOR
LASER SWITCH
BC337-40
PC74HCU04T
PDM
ACCELERATE
BREAK
PWM
TDA7073A
PTC 4.7R
TRACK
FOCUS
SLIDE
ACCELERATE
BREAK
16MHz
OTD
NRST
SIDA/DA
SICL/CL
SILD
TRAY MOTOR
TDA7072A
TRAY
SIGNAL PROCESSOR INTERFACE
SERVO PROCESSOR INTERFACE
MC68HC05C4CS
PORT A
PORT B
PORT C
PORT D
CPU
OSCILLATOR
TIMER
ROM
RAM
SPI
SCI
RESET
RAB
SICL/CL
SIDA/DA
NRST
SILD
TRAY CONTROL
INNER SWITCH
TRAY OUT = LOW
TRAY IN = HIGH
NO ACTION = 2.1V
DATA
STROBE
ACKN
MAIN PROCESSOR INTERFACE
POWER DOWN RESET
BC558B
BZX79-C3V9
FCR4.0MCT
MUTE
BC337-40
BC558B
BZX79 C3V9
BC807-40
STBY=H
1N4148
7805
FLAP LOADING optional
TRAY SWITCH
TRAY OR FLAP LOADING SELECTION
pin25 pin24
0 0 TRAY
1 0 MECHANICAL DOOR
1 1 NO LOADING
DAC VERSION SELECTION
pin23 1 = TDA1311
0 = TDA1549
CD LEFT
GNDA
CD RIGHT
RESET
ACKN
STROBE
DATA
TO / FROM FRONT BOARD
GND
+CD
FROM POWER BOARD
+10V (7.2V-13.5V)
GNDA

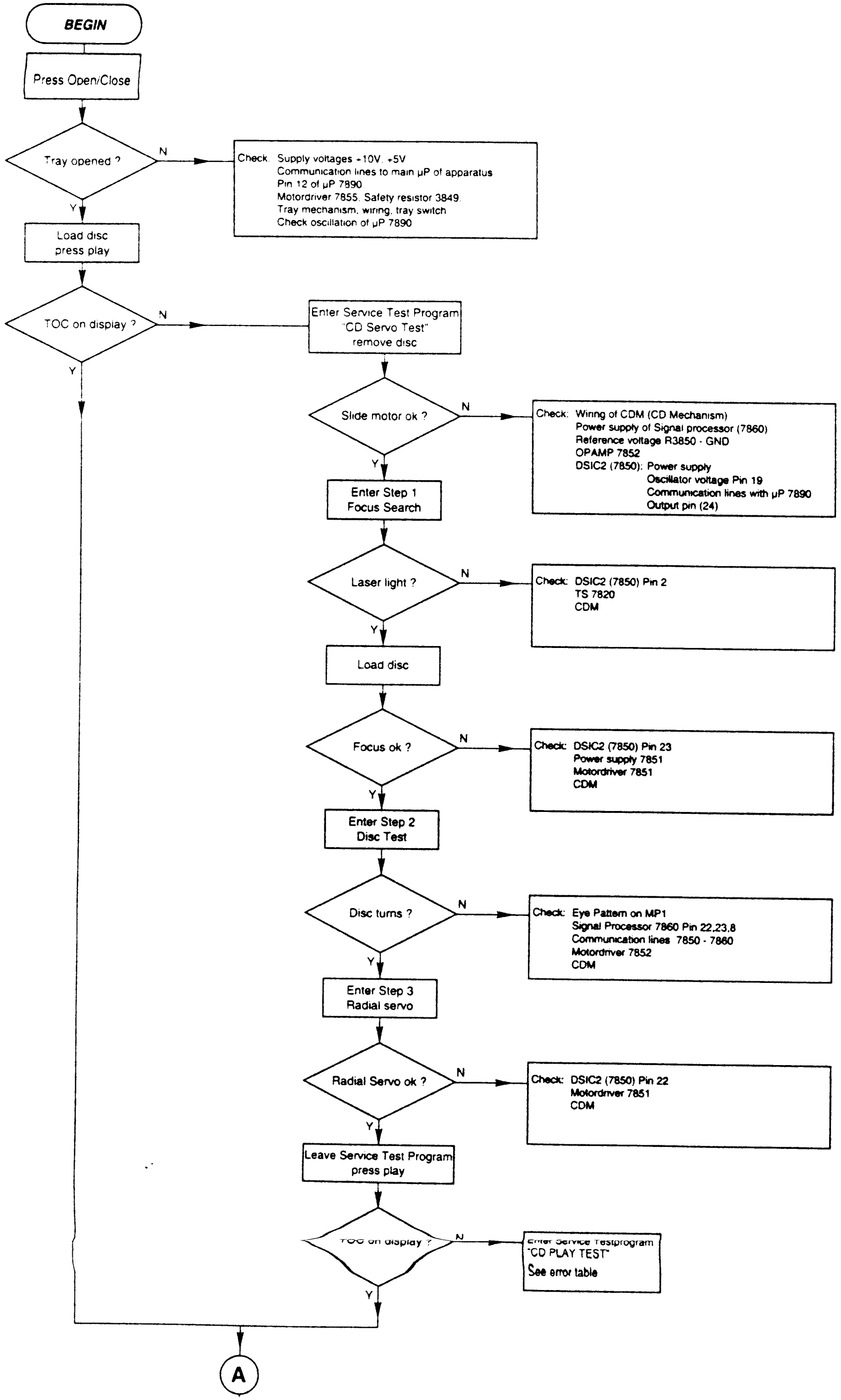

A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
OPAMP 7800 (version only)
Mute circuit 7885, 7884
Check: Communication lines of signal processor 7860 -DAC
DAC Version selection (µP pin 23)
TS7872 (TDA1311 version only)
DAC 7871
Mute circuit - Pin 44 / 7890 - µP
Pin 27 / 7860 - Signal processor
TS 7883
Digital out ? (optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 2
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END

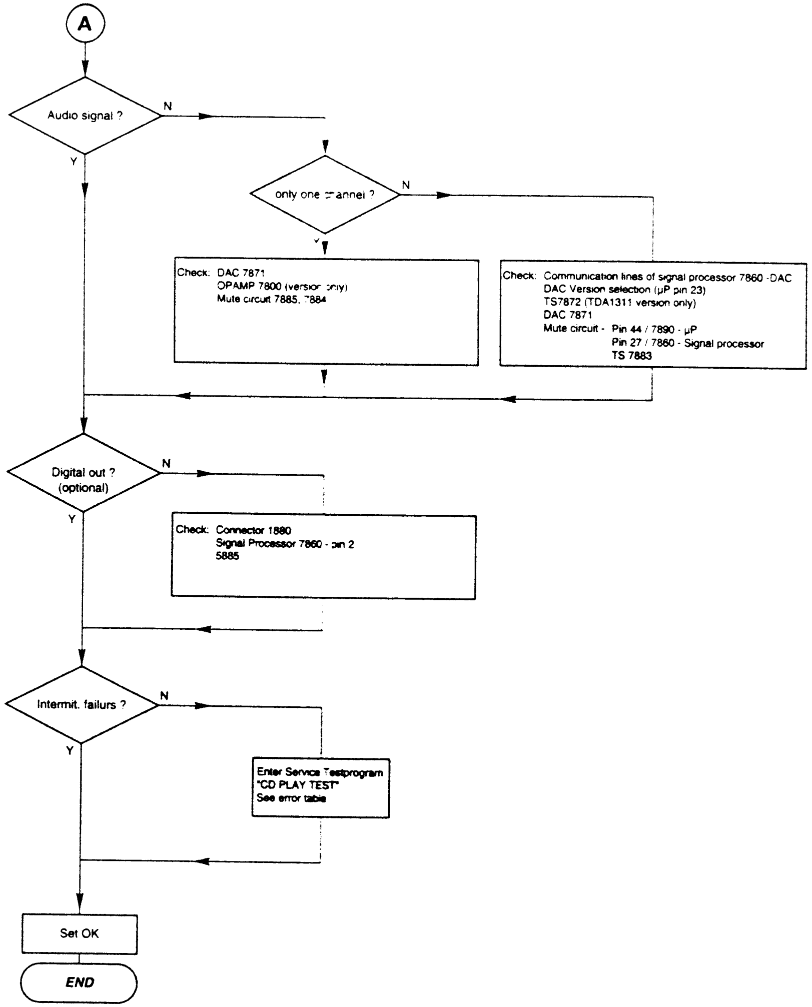
DSIC2 ***D****igital* ***S****ervo* ***IC*** TDA1301T/N1

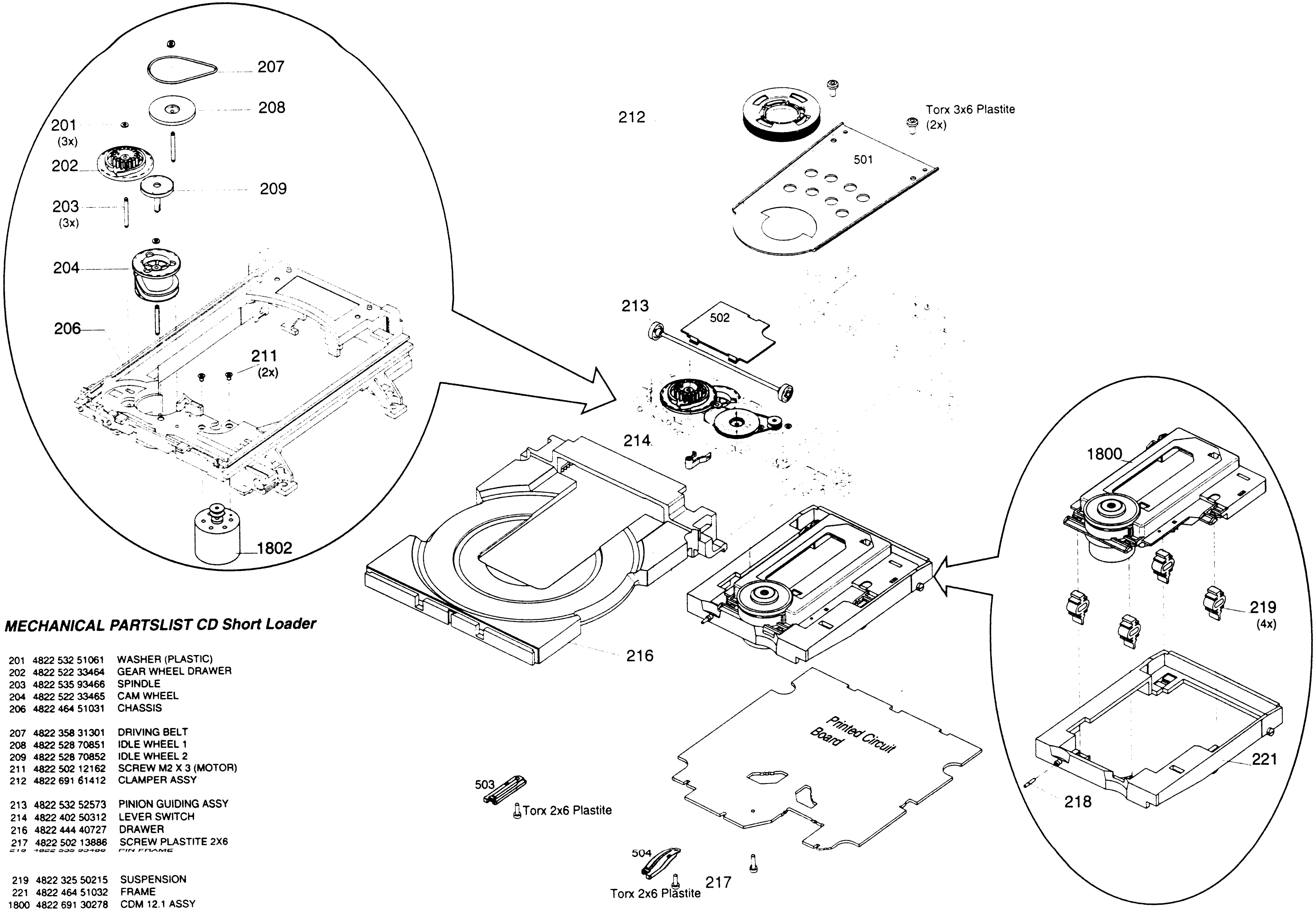
Pin	*Name*	*Direction*	*Description*
1	RESET	µP -> DSIC2	Reset input (Low level is active)
2	Laser On/Off	DSIC -> Laser switch	Switches Laser on/off (High level is active)
3	Gnd	Gnd	Ground (Analogue part)
4	VRH	not connected	High reference input for A/D converter
5	D1	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
6	D2	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
7	D3	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
8	VRL	Gnd	Low reference input for A/D converter
9	D4	Diode array -> DSIC2	Unipolar current input (Central diode signal input)
10	R1	Diode array -> DSIC2	Unipolar current input (Satellite diode signal input)
11	R2	Diode array -> DSIC2	Unipolar current input (Satellite diode signal input)
12	VDD(A)		Positive supply for Analog part
13	XTLR		Input for adjustment of oscillator gain
14	TS1	Gnd	Test input 1 (connected to ground)
15	TS2	Gnd	Test input 2 (connected to ground)
16	OTD	DSIC2 -> Signal Processor	Off Track Detection output (Low level is active)
17	CLO	not connected	Buffered Clock Output
18	XTLO		Oscillator output or ext. clock input pin for 8.4672, 12.7008 or 16.9344MHz
19	XTLI		Oscillator input or ext. clock input pin for 8.4672, 12.7008 or 16.9344MHz
20	VDD(D)		Positive supply for Digital part
21	Gnd		Ground (Digital part)
22	Track	DSIC2 -> Servo Driver	Radial control output
23	Focus	DSIC2 -> Servo Driver	Focus control output
24	Slide	DSIC2 -> Motor Driver	Slide motor control output
25	SILD	µP -> DSIC2	Serial Interface Load
26	SICL	µP -> DSIC2	Serial Interface Clock
27	SIDA	µP <-> DSIC2	Serial Interface Data
28	VDD(D)		Positive supply for Digital part

SIGNAL PROCESSOR SAA7345GP/M5

Pin	*Name*	*Direction*	*Description*
1	CL11	not connected	11.2896MHz clock output (3-state)
2	DOBM	signal processor -> Digital out	digital bi-phase mark output (3-state)
3	V1	DSIC2 -> signal processor	versatile input pin of signal processor
4	V2	not connected	versatile input pin of signal processor
5	Test2	GND	test input of signal processor
6	Test1	GND	test input of signal processor
7	ISLICE	signal processor -> signal processor	current feedback from internal data slicer
8	HFIN	HF Pre-amp -> signal processor	comparator signal input
9	HFREF	HF Pre-amp -> signal processor	comparator signal input
10	IREF	-> signal processor	reference current pin (nom. VDD/2)
11	VDDA		+supply (analog) of signal processor
12	VSSA		-supply (analog) of signal processor
13	CRIN	X-tal -> signal processor	crystal/resonator input of signal processor
14	CROUT	signal processor -> X-Tal	crystal/resonator output of signal processor
15	VDD1		+supply for I/O-buffers of signal processor
16	VSS1		-supply for I/O-buffers of signal processor
17	CL16	not connected	16.9344MHz clock output of signal processor
18	MISC	not connected	general purpose DAC output (3-state)
19	DATA	signal processor -> DAC	serial data output of signal processor (3-state)
20	WCLK	signal processor -> DAC	word clock output of signal processor (3-state)
21	SCLK	signal processor -> DAC	serial bit clock output of signal processor (3-state)
22	MOTOR1	signal processor -> Disc motor driver	motor output1 of signal processor; versatile (3-state)
23	MOTOR2	signal processor -> Disc motor driver	motor output 2 of signal processor; versatile (3-state)
24	V5	not connected	versatile output pin of signal processor
25	V4	not connected	versatile output pin of signal processor
26	V3	not connected	versatile output pin of signal processor (open drain)
27	KILL	signal processor -> Mute circuit	Mute output; programmable (open drain)
28	PORE	µP -> signal processor	power-on reset enable input (active low)
29	CLA	not connected	4.2336MHz microprocessor clock output
30	DA	µP <-> signal processor	interface data I/O-line
31	CL	µP -> signal processor	interface clock input line
32	RAB	µP -> signal processor	interface R/W and acknowledge input
33	CFLG	signal processor ->	correction flag output (open drain)
34-42	not used		
43	VSS2		Positive supply for internal logic of signal processor
44	VDD2	GND	Negative supply for internal logic of signal processor

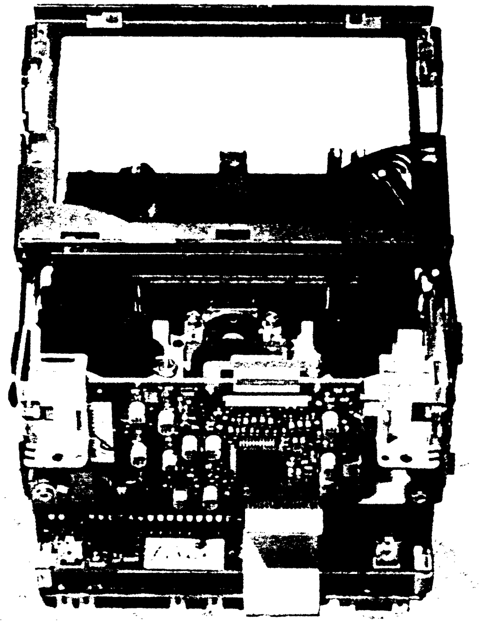

BEGIN
Press Open/Close
Tray opened ?
N
Check. Supply voltages +10V. +5V
Communication lines to main µP of apparatus
Pin 12 of µP 7890
Motordriver 7855. Safety resistor 3849.
Tray mechanism, wiring, tray switch
Check oscillation of µP 7890
Y
Load disc
press play
TOC on display ?
N
Enter Service Test Program
"CD Servo Test"
remove disc
Slide motor ok ?
N
Check: Wiring of CDM (CD Mechanism)
Power supply of Signal processor (7860)
Reference voltage R3850 - GND
OPAMP 7852
DSIC2 (7850): Power supply
Oscillator voltage Pin 19
Communication lines with µP 7890
Output pin (24)
Y
Enter Step 1
Focus Search
Laser light ?
N
Check: DSIC2 (7850) Pin 2
TS 7820
CDM
Y
Load disc
Focus ok ?
N
Check: DSIC2 (7850) Pin 23
Power supply 7851
Motordriver 7851
CDM
Y
Enter Step 2
Disc Test
Disc turns ?
N
Check: Eye Pattern on MP1
Signal Processor 7860 Pin 22,23,8
Communication lines 7850 - 7860
Motordriver 7852
CDM
Y
Enter Step 3
Radial servo
Radial Servo ok ?
N
Check: DSIC2 (7850) Pin 22
Motordriver 7851
CDM
Y
Leave Service Test Program
press play
TOC on display ?
N
Enter Service Testprogram
"CD PLAY TEST"
See error table
Y
Y
A


A
Audio signal ?
N
Y
only one channel ?
N
Y
Check: DAC 7871
OPAMP 7800 (version only)
Mute circuit 7885, 7884
Check: Communication lines of signal processor 7860 -DAC
DAC Version selection (µP pin 23)
TS7872 (TDA1311 version only)
DAC 7871
Mute circuit - Pin 44 / 7890 - µP
Pin 27 / 7860 - Signal processor
TS 7883
Digital out ?
(optional)
N
Y
Check: Connector 1880
Signal Processor 7860 - pin 2
5885
Intermit. failurs ?
N
Y
Enter Service Testprogram
"CD PLAY TEST"
See error table
Set OK
END


207
208
201
(3x)
202
209
203
(3x)
204
206
211
(2x)
1802
212
Torx 3x6 Plastite
(2x)
501
213
502
214
1800
216
219
(4x)
Printed Circuit Board
221
218
503
Torx 2x6 Plastite
504
Torx 2x6 Plastite
217
CS 52 074

MECHANICAL PARTSLIST CD Short Loader

201	4822 532 51061	WASHER (PLASTIC)
202	4822 522 33464	GEAR WHEEL DRAWER
203	4822 535 93466	SPINDLE
204	4822 522 33465	CAM WHEEL
206	4822 464 51031	CHASSIS
207	4822 358 31301	DRIVING BELT
208	4822 528 70851	IDLE WHEEL 1
209	4822 528 70852	IDLE WHEEL 2
211	4822 502 12162	SCREW M2 X 3 (MOTOR)
212	4822 691 61412	CLAMPER ASSY
213	4822 532 52573	PINION GUIDING ASSY
214	4822 402 50312	LEVER SWITCH
216	4822 444 40727	DRAWER
217	4822 502 13886	SCREW PLASTITE 2X6
218	4822 535 93486	PIN FRAME
219	4822 325 50215	SUSPENSION
221	4822 464 51032	FRAME
1800	4822 691 30278	CDM 12.1 ASSY
1802	4822 361 21708	MOTOR ASSY
	4822 502 30735	SCREW 3 X 6 PLASTITE



DIGITAL DECK UNIT DDU2212

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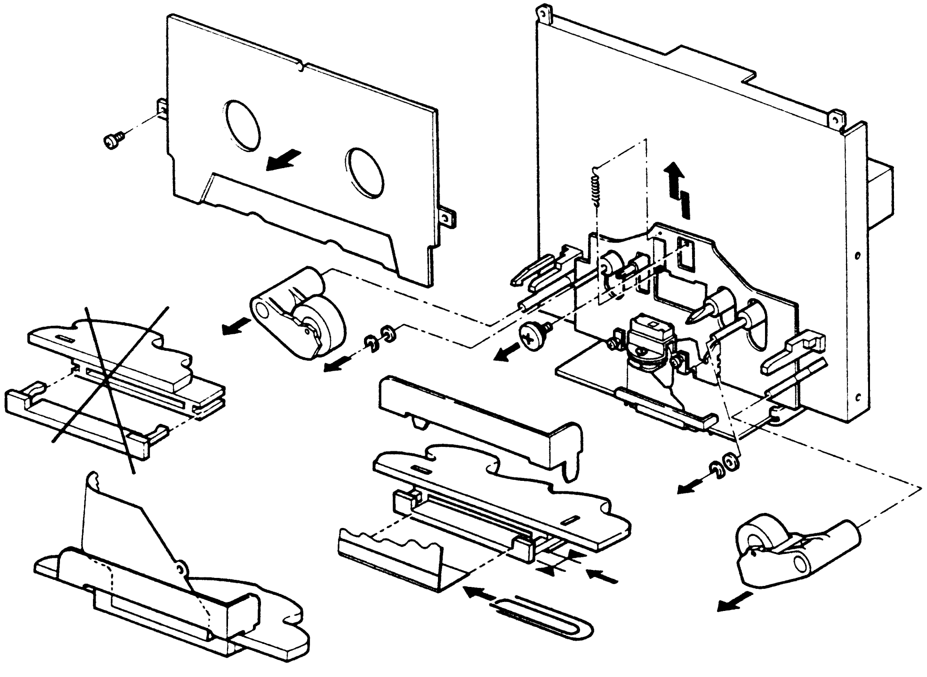
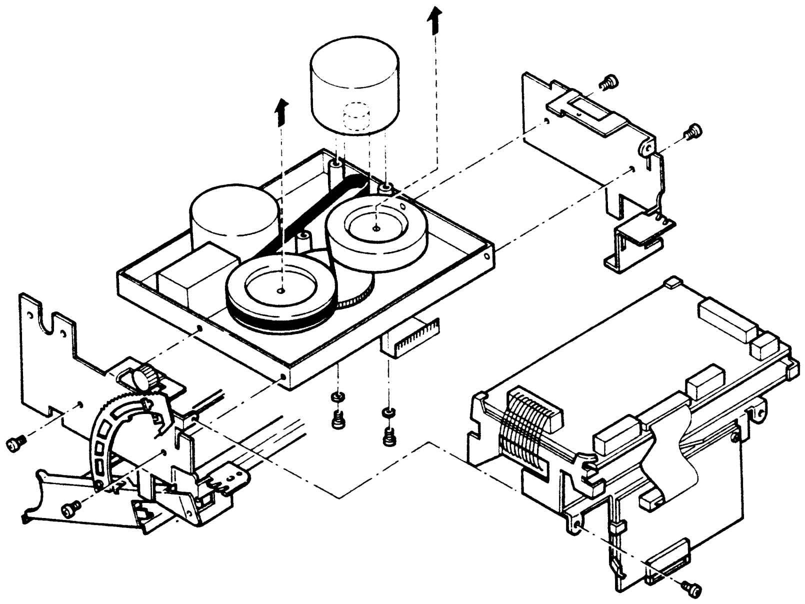
Dismantling of head-support assembly (pos. 117)

- Loosen 2 screws of cover plate (pos. 81) and remove plate
- Remove pinch roller assemblies (pos. 102, 118)
- Open connector 1800 of head´s flexfoil
  Warning: Do not open the connector too far – it will damage it
- Remove flexfoil and short-circuit the tracks
- Remove head-support spring (pos. 503)
- Loosen head-support fixation screw (pos. 105)
- Remove head-support assembly (pos. 117)



Dismantling of fly wheels (pos. 108, 126)

- Open connector 1800 of head´s flexfoil (see previous page)
  Warning: Do not open the bracket too far – it will damage the connector
- Remove flexfoil and short-circuit the tracks (see previous page)
- Loosen 2 screws of metal bracket (pos. 585) and remove bracket
- Loosen 4 screws of side parts (pos. 580, 584) and remove side parts & flap assembly (pos. 82)
- Loosen 2 screws of capstan motor (pos. 102) and remove motor
- Loosen E-clips (E1.65) and remove fly wheels (pos. 108, 126)



Repair position

DCC Boards

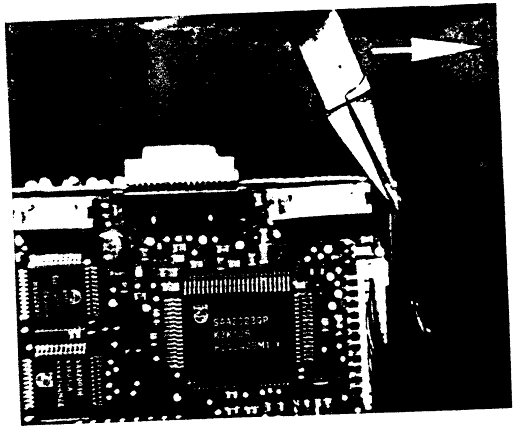


fig. 1

Bend metal flap (left and right) sidewards to release printed circuit board. See figure 1.

Service position
DCC Boards

Fix the Digital Board in the metal bracket as shown in figure 2.

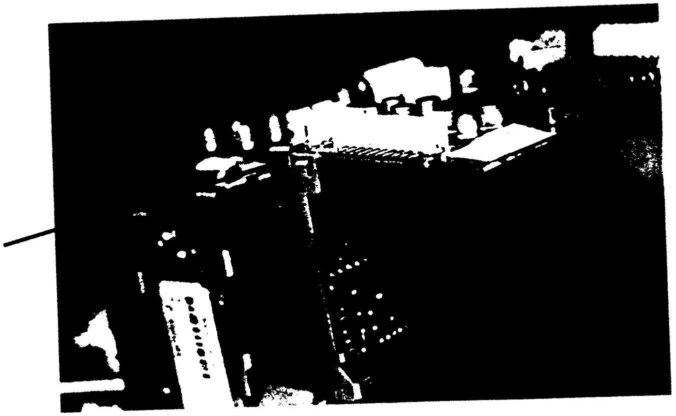
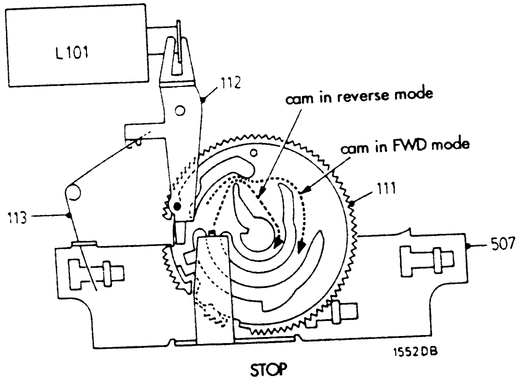
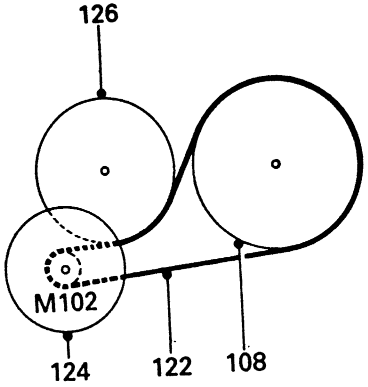


fig. 2

Gear wheel


L101
112
cam in reverse mode
cam in FWD mode
111
113
507
STOP
1552DB

Mounting belt


126
M102
124
122
108

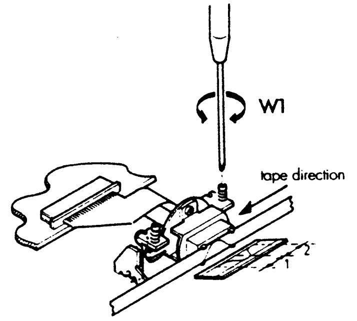
Adjustment of azimuth (DCC deck)

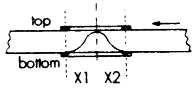
Due to the Fixed Azimuth Tape Guides (FATG) and Azimuth Locking Pins (ALP), with a mirror cassette (4822 395 30288) the azimuth can be adjusted.

- For normal direction adjust with the first azimuth screw (A) for synchronous left and right part part of the mirror picture.
- For reverse direction adjust with the second azimuth screw (B) for synchronous left and right part part of the mirror picture.

The mirror picture can be devided into two parts. One part reaches from first FATG to head mid position, and the other part from head mid position to the other FATG.

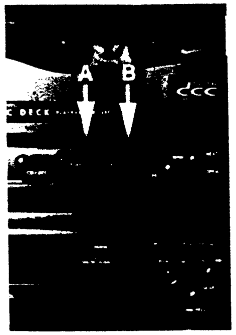
Normal direction



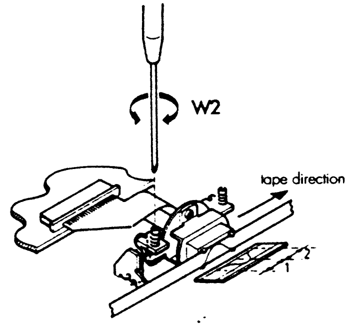


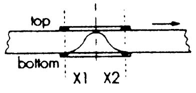
Adjust: X1=X2

Location of azimuth screws



Reverse direction





Adjust: X1=X2

ABBREVIATIONS

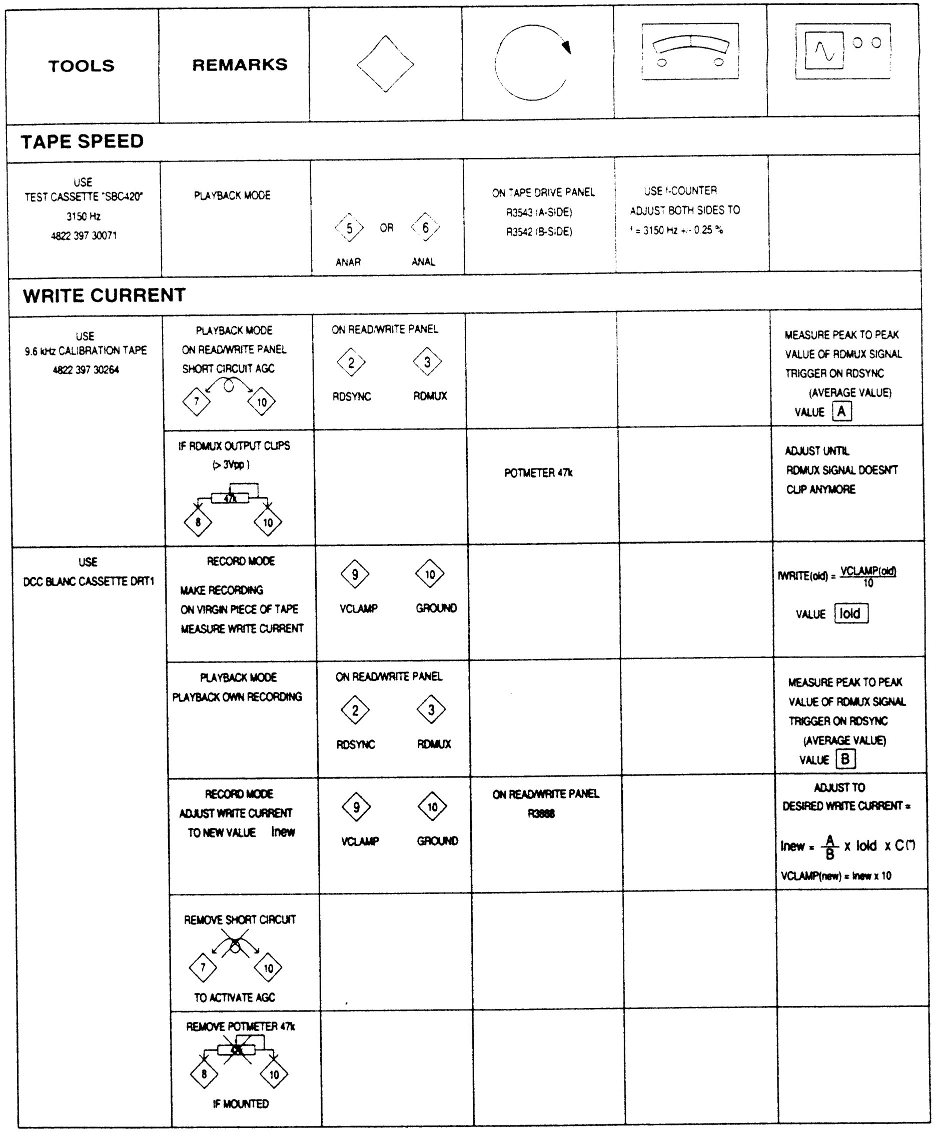
+10VD	10 Volt digital supply output
+5VA	+5 Volt analog supply
+5VD	5 Volt digital supply
70/12µs circuit	Selection in ACC mode for Chrome/Ferro tape
A0	Address SRAM; Address DRAM
A1	Address SRAM; Address DRAM
A1 0/RAS	Address SRAM; RAS DRAM
A1 1	Address SRAM
A1 2/PinO5	Address SRAM; Address DRAM; Port expander output 5
A1 3/PinO2	Address SRAM; Address DRAM; Port expander output 2
A1 4/PinO1	Address SRAM; Address DRAM; Port expander output 1
A1 5/PinO4	Address SRAM; Address DRAM; Port expander output 4
A1 6/PinO3	Address SRAM; Address DRAM; Port expander output 3
A2	Address SRAM; Address DRAM
A3	Address SRAM; Address DRAM
A4	Address SRAM; Address DRAM
A5	Address SRAM; Address DRAM
A6	Address SRAM; Address DRAM
A7	Address SRAM; Address DRAM
A8	Address SRAM; Address DRAM
A9/CAS	Address SRAM; CAS for DRAM
A1+	Analog reader ACC Left channel
A2+	Analog reader ACC Right channel
ACC/NDCC	Analog or DCC playback
ACCL	ACC output Left
ACCR	ACC output Right
ADAS3	Adaptive Allocation and Scaling IC
ADC	Analog Digital Converter
ALP	Azimuth Locking Pins
AMS	Automatic Music Selection on AnalogCompact Cassette
ANAEYE	Analogue eye pattern output
ANAL	ACC output Left
ANAR	ACC output Right
ATSB	12 dB attenuation (active LOW)
ATTDAC	DAC attenuation control
AUX channel	Auxiliary channel
AZCHK	channel 0 and channel 7 azimuth monitor
BCK	bit clock input
BIAS	Bias current for ADC
BIL	buffer op-amp inverting input for left channel
BIR	buffer op-amp inverting input for right channel
BOL	buffer op-amp inverting input for left channel
BOR	buffer op-amp output for right channel
CAP_A	Capstan motor control connection A
CAP_B	Capstan motor control connection B
CAPSTAN	Low output level switches the capstan motor on
CAPSTAN+	Capstan motor + connection
CAPSTAN-	Capstan motor - connection
CEDC	system clock output
CHMODE	use of channel status (0=professional use, 1=consumer use)
CHROME	Indication if a chrome analog cassette is inserted
CHTST1	Channel test pin 1
CHTST2	Channel test pin 2
CKIN	system clock input
CKSL1	clock selection 1
CKSL2	clock selection 2
CLAMP	Write current output
CLK22	22.5792 MHz buffered clock output of SFC3
CLK24	24.576 MHz XTAL buffered clock output of SFC3
CLKSEL	select system clock
CLOCK	Serial data clock from controller
COA	Common analog
COD	Common digital
COPY	copyright status bit
CRO2/TRAY_OPEN	CRO2/FE cassette detection switch input if N_CASS_PRES = L L = FE: H = CRO2 if N_CASS_PRES = H L = tray fully opened, H = tray is not fully opened
CTRLMODE	select µP/stand-alone mode
D0	Data SRAM; Data DRAM
D1	Data SRAM; Data DRAM
D2	Data SRAM; Data DRAM
D3	Data SRAM; Data DRAM
D4	Data SRAM;
D5	Data SRAM;
D6	Data SRAM;
D7	Data SRAM;
DACL	Analog audio output left
DACR	Analog audio output right
DATA	data input
DCC_CASS_PRES	DCC cassette present switch input
DEEM	pre-emphasis output bit
DEEM1	de-eemphasis on/off
DEEM2	de-eemphasis on/off
DEEMDAC	DAC control output
DSMB	double speed mode (active LOW)
ERCOSTAT	ERCO status, for test only
FDAI	filtered serial data input (from ADAS)
FDAO	filtered serial data output (to ADAS)
FDCL	filtered data bit clock
FDIR	PASC mode encode/decode
FDWS	filtered data word select
FILTCL	capacitor for left channel 1st order filter function
FILTCR	capacitor for right channel 1st order filter function
FRESET	reset signal from codec
FS256	master audio clock at 256x sample frequency
FS32	indicates sample frequency=32kHz
FS44	indicates sample frequency=44kHz
FS48	indicates sample frequency=48kHz
FSYNC	subband synchronisation on F-I2S bus
GNDA	Analog ground
GNDD	Digital ground
GNDS	Analog motors ground
HOLD	DDU is busy flag
HPEN	high pass filter enable input
I2SOUTEN	serial audio output enable
I2SSEL	select auxiliary input or normal input in transmit mode
IN 0-7	Head signals of main data channels
INAUX	Head signal of auxiliary data
INL	Analog input signals from DCC head
INMFL	Magnetic feedback amplifier input left

INMFR	Magnetic feedback amplifier input right
INR	Analog input signals from DCC head
INVALID	validity of audio sample input/output
IREF	current reference node
L3	L3 bus
L3CLK	L3 bus clock line
L3CLKC	codec interface clock
L3CLKM	microcontroller interface clock
L3DATA	L3 bus serial data line
L3DATAC	codec interface data
L3DATAM	microcontroller interface data
L3INT	L3 interrupt output
L3MODE	Mode line for L3 interface
L3MODEC	codec interface mode
L3MODEM	microcontroller interface mode
L3REF	L3 bus timing reference
LADDR	microprocessor interface address switch input
LCLK	microprocessor interface clock line input
LDATA	microprocessor interface data line input/output
LEFT INPUT	Analog audio input left
LMODE	microprocessor interface mode line input
LOWPOWER	Low power playback reset
LTCNT0	LT compatible interface mode control
LTCNT0C	SAA2002 SFC interface mode control
LTCNT1	LT compatible interface mode control
LTCNT1C	SAA2002 SFC interface mode control
M0	(test mode input) connect to VDD
M1	(test mode input) connect to VDD
MAIN µP	Digital board microprocessor
MCLK	6.144 MHz clock output
MESSAGE_SYNC	Indication line of block transfers from digital board µP to front µP, see MESSYNC
MESSYNC	Message synchronisation with controller
MFL1	feedback amplifier output left 1
MFL2	feedback amplifier output left 2
MFR1	feedback amplifier output right 1
MFR2	feedback amplifier output right 2
MLE	Latch enable signal for digital filter
MRH	Magneto Resistive thin film Head
MSYNC	Message synchronisation from Tape drive board µP with Digital board µP
MUSB	muting (active LOW)
MUTE	audio mute input
MUTEDAC	DAC control or general purpose output
N_CASS_PRES	Cassette present switch input
N_DCC_REC_PROT	DCC record protect switch input
N_FAILP	Power fail (L = power failure)
N_FLAP_PRESENT	Flap loader present indication
N_HOLE3	DCC tape length indication switch input
N_HOLE4	DCC tape length indication switch input
N_HOLE5	DCC tape length indication switch input
N_PLAY_POS	Indication if head is in play position
N_QREV_PRES	Quick reverse sensor present
NC	not connected
N_DDC_REC_PROT	DCC record protection switch input
N_MUTE	Mute for audio channels (active low)
NODONE	No done state selection
N_RESET	Master reset Digital Unit

OEN	Output Enable for RAM
OUT 0-7	Main data output 0 till 7 of read IC
OUTAUX	*Parallel output of read IC*
OUTL	Analog (CC) output left
OUTR	Analog (CC) output right
OVLD	overload indication output
PASC	Precision Adaptive Sub-band Coding
PINO1	Port expander output 1
PinO2/SPEEDB	Port expander output 2/ PWM capstan control output for deck B
PLAY MAG	Connection to the solenoid on the DDU deck
POR	Power On Reset
PRGSTAT	TFE3 program status, for test only
PWRDWN	enable power-down input in the standby mode Put DRP into power down mode
QA-QJ	Signal for write heads
QUICK_REVERSE	Quick reverse input signal
R0+	Digital reader CH0 (Hot)
R1+	Digital reader CH1 (Hot)
R2+	Digital reader CH2 (Hot)
R3+	Digital reader CH3 (Hot)
R4+	Digital reader CH4 (Hot)
R5+	Digital reader CH5 (Hot)
R6+	Digital reader CH6 (Hot)
R7+	Digital reader CH7 (Hot)
RCfil	pin for PLL loop filter
RCint	pin for integrating capacitor
RDCLK	read clock input
RDMUX	Analogue multiplexed input from READ AMPLIFIER
RDSYNC	Synchronisation output for READ AMPLIFIER
RESET	Reset signal from Digital Unit controller
RESET_UP	Reset tape drive module µP
RESOL0	resolution selection 0
RESOL1	resolution selection 1
RIGHT INPUT	Analog audio input right
RSENSE	sense voltage positive input
RX+	Digital reader AUX channel (Hot)
RXD	Serial data input from tape drive unit
SBCL	Bit clock for sub-band I2S interface
SBCL	sub-band bit clock
SBDA	Data line for sub-band I2S interface DRP
SBDIR	Direction line for sub-band I2S interface DRP
SBEF	Sub-band I2S error flag line
SBMCLK	Master clock for sub-band I2S interface DRP
SBWS	Word selector for sub-band I2S interface DRP
SCK	I2S bus clock line
SCL	baseband bit clock
SCMS	Serial Copy Management System
SD	serial data input/output; I2S-bus
SDA1	baseband serial data to/from ADC
SDA2	baseband serial data output to DAC
SDAD	Serial data from AD-converter
SDAUX	auxiliary serial data input; I2S-bus
SDDAC	I2S bus data line for DAC
SDO	serial interface data output
SFC3COMP	SFC3 (SAA2003) compatibility mode
SFOR	input for selecting serial interface output format
SHIELD	Shield connection

SLAVE	input for selecting serial interface operating mode MASTER/SLAVE
SLAVE_IN	Serial data from controller
SLAVE_OUT	Serial data to controller
SPEED	PWM capstan control output for deck
SREEL	Tacho Sypply reel
STANDBY	device inactive
STD	input for selecting STANDBY mode
STROBE	strobe for control register (active high)
SUBSTR	Substrate connection
SWS	serial interface word select signal
SYSCLKI	system clock input
SYSCLKO	system clock output
TA1	Feedback conductor ACC Left ch.
TA2	Feedback conductor ACC Left ch.
TA8	Feedback conductor ACC Right ch.
TA9	Feedback conductor ACC Right ch.
TCLOCK	3.072 MHz clock output for tape I/O
TD1	Test conductor digital
TD2	Test conductor digital
TDAPLB	Control bits
TERAUX	Control bits
TEST0	test mode select
TEST1	test mode select
TEST2	Test mode select
TOC	Table of Contents of Sub-code info
TREEL	Tacho Take-up reel
TXD	Serial data output to tape drive unit
UDAVAIL	synchronisation for output user data (0=data available, 1=no data)
UNLOCK	PLL out-of-lock (0=not locked, 1=locked)
URDA	unreliable data from drive processing
VCCA	Positive supply voltage CC-part (+5V)
VCCM	Positive supply voltage feedback amplifier (+5V)
VDACN	negative 1 bit DAC reference voltage input (connected 0V)
VDACP	positive 1 bit DAC reference voltage input (connected 5V)
VDD	Positive supply voltage DCC-part (+5V)
VddO	Supply voltage (write outputs)
VEEA	Analog ground
VEED	Digital ground
VEEM	Ground for playback amplifier
VOL	left channel output
VOR	right channel output
VSS	Supply ground (0V)
VssE	erase current source ground
VssS	sense voltage ground
W01	Digital writer (CH0/CH1)
W12	Digital writer (CH1/CH2)
W23	Digital writer (CH2/CH3)
W34	Digital writer (CH3/CH4)
W45	Digital writer (CH4/CH5)
W56	Digital writer (CH5/CH6)
W67	Digital writer (CH6/CH7)
W7-	Digital writer (CH7)
WCLK	write clock input
WDATA	Serial output to WRITE AMPLIFIER
WEN	Write enable for RAM
WIND+	Reel motor + connection
WIND-	Reel motor - connection
WRITE-STDBY	Write amplifier stand-by
WS	word select input/output, I2S-bus
WX-	Digital writer (AUX channel)
WX0	Digital writer (AUX channel/CH0)
X22IN	22.5792 MHz XTAL oscillator input
X22OUT	22.5792 MHz XTAL oscillator output
X24IN	24.576 MHz XTAL oscillator input
X24OUT	24.576 MHz XTAL oscillator output
X256	master audio clock input from external source
Xin	system clock input

ADJUSTMENT TABLE

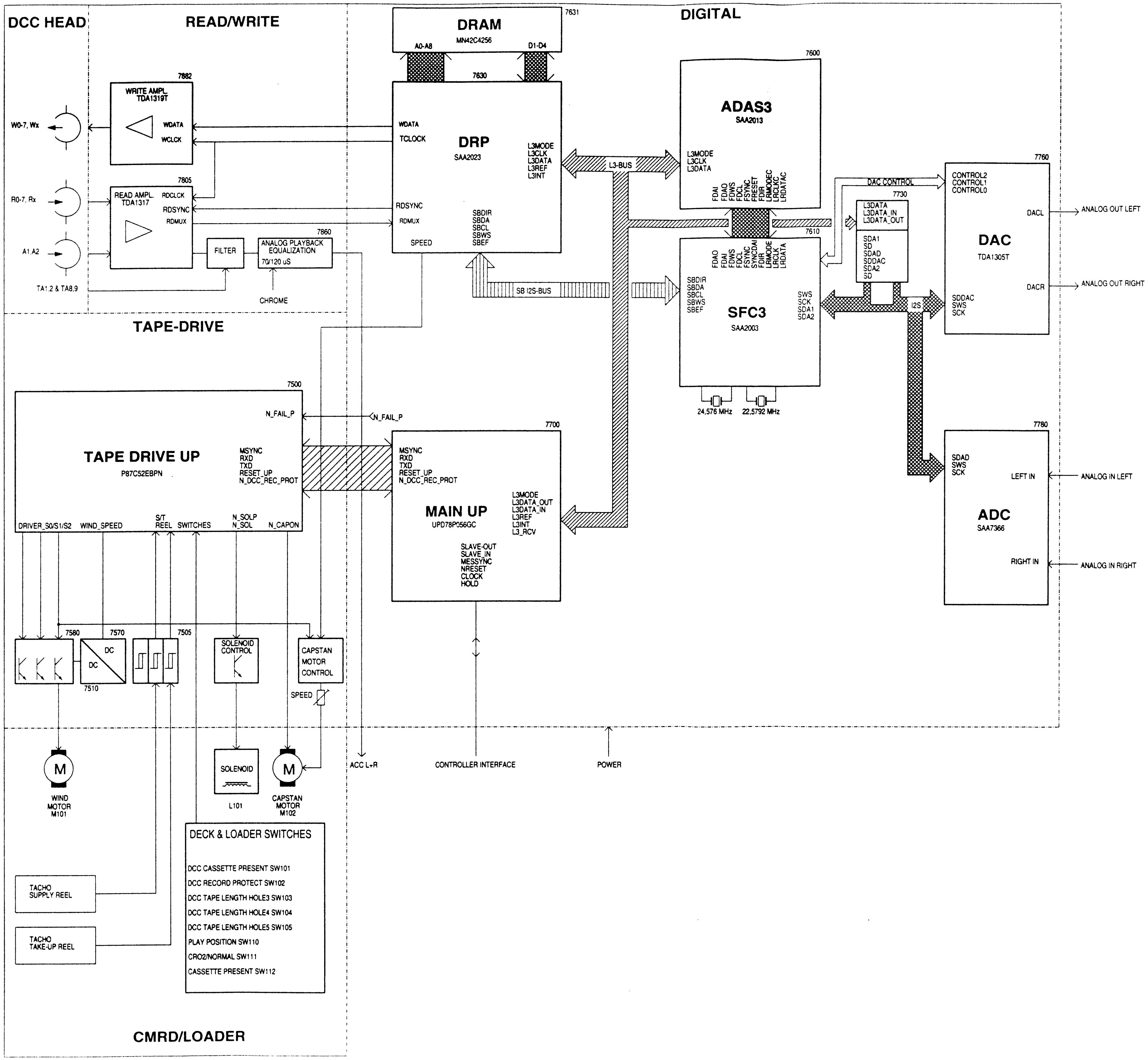


TOOLS	REMARKS	◇	↻		∿
TAPE SPEED					
USE TEST CASSETTE "SBC420" 3150 Hz 4822 397 30071	PLAYBACK MODE	◇5 OR ◇6 ANAR ANAL	ON TAPE DRIVE PANEL R3543 (A-SIDE) R3542 (B-SIDE)	USE f-COUNTER ADJUST BOTH SIDES TO f = 3150 Hz +/- 0.25 %	
WRITE CURRENT					
USE 9.6 kHz CALIBRATION TAPE 4822 397 30264	PLAYBACK MODE ON READ/WRITE PANEL SHORT CIRCUIT AGC ◇7 ◇10	ON READ/WRITE PANEL ◇2 ◇3 RDSYNC RDMUX			MEASURE PEAK TO PEAK VALUE OF RDMUX SIGNAL TRIGGER ON RDSYNC (AVERAGE VALUE) VALUE $\boxed{A}$
	IF RDMUX OUTPUT CLIPS (> 3Vpp) 47k ◇8 ◇10		POTMETER 47k		ADJUST UNTIL RDMUX SIGNAL DOESN'T CLIP ANYMORE
USE DCC BLANC CASSETTE DRT1	RECORD MODE MAKE RECORDING ON VIRGIN PIECE OF TAPE MEASURE WRITE CURRENT	◇9 ◇10 VCLAMP GROUND			$I_{WRITE(old)} = \frac{VCLAMP(old)}{10}$ VALUE $\boxed{Iold}$
	PLAYBACK MODE PLAYBACK OWN RECORDING	ON READ/WRITE PANEL ◇2 ◇3 RDSYNC RDMUX			MEASURE PEAK TO PEAK VALUE OF RDMUX SIGNAL TRIGGER ON RDSYNC (AVERAGE VALUE) VALUE $\boxed{B}$
	RECORD MODE ADJUST WRITE CURRENT TO NEW VALUE Inew	◇9 ◇10 VCLAMP GROUND	ON READ/WRITE PANEL R3888		ADJUST TO DESIRED WRITE CURRENT = $Inew = \frac{A}{B} \times Iold \times C(*)$ $VCLAMP(new) = Inew \times 10$
	REMOVE SHORT CIRCUIT ◇7 ◇10 TO ACTIVATE AGC				
	REMOVE POTMETER 47k ◇8 ◇10 IF MOUNTED				

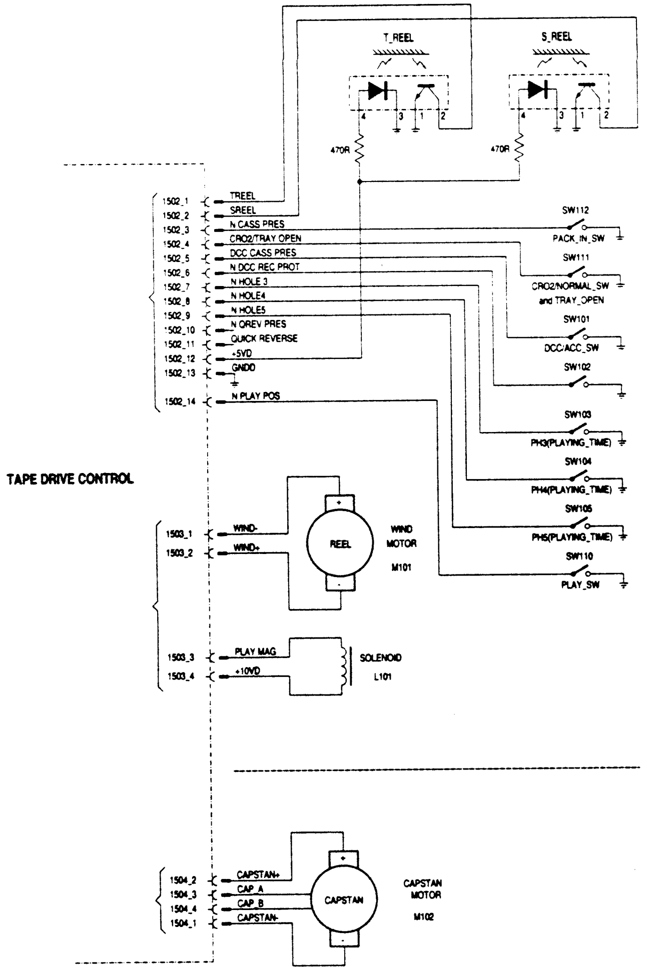
(*) C = CORRECTIONFACTOR FOR 9.6 kHz CASSETTE = 1.135(= +1.1dB)

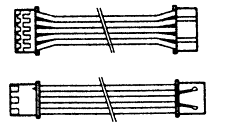
HAS1148
9515

BLOCKDIAGRAM

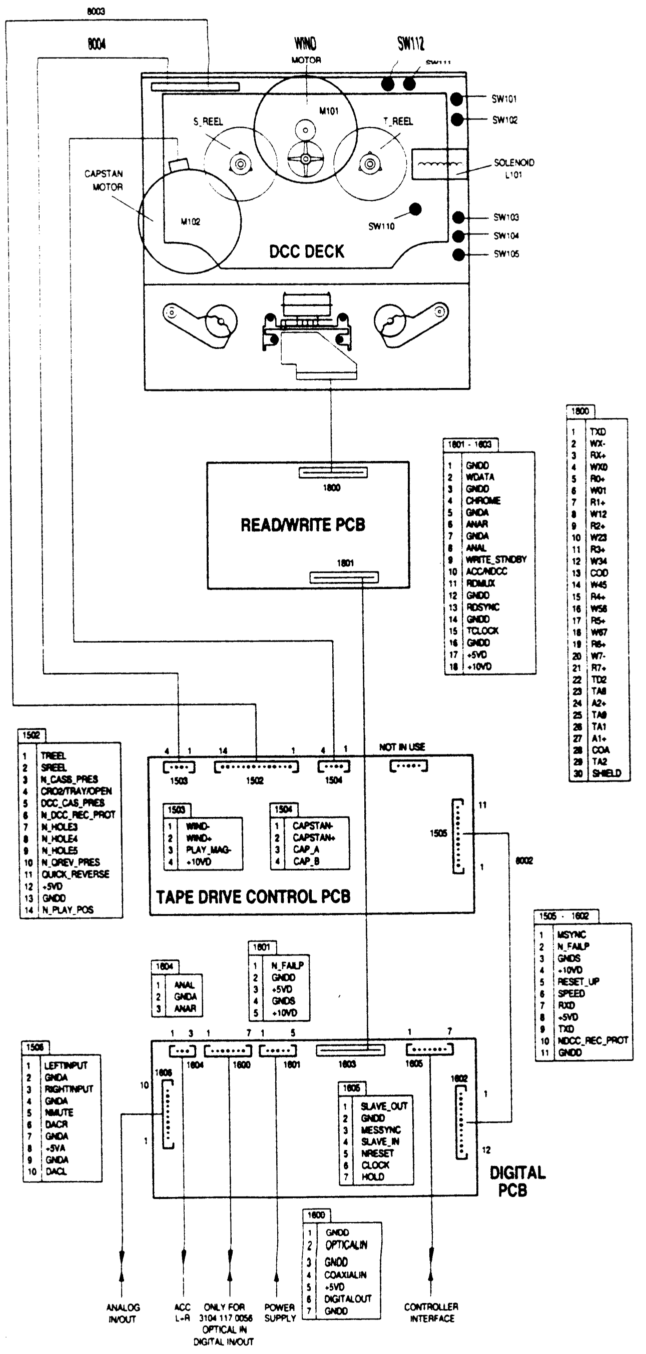

DCC HEAD
READ/WRITE
DIGITAL
TAPE-DRIVE
CMRD/LOADER
W0-7, Wx
R0-7, Rx
A1,A2
TA1,2 & TA8,9
7882
WRITE AMPL.
TDA1319T
WDATA
WCLCK
7805
READ AMPL.
TDA1317
RDCLCK
RDSYNC
RDMUX
FILTER
7860
ANALOG PLAYBACK EQUALIZATION
70/120 uS
CHROME
7631
DRAM
MN42C4256
A0-A8
D1-D4
7630
DRP
SAA2023
WDATA
TCLOCK
RDSYNC
RDMUX
SPEED
L3MODE
L3CLK
L3DATA
L3REF
L3INT
SBDIR
SBDA
SBCL
SBWS
SBEF
L3-BUS
SB I2S-BUS
7600
ADAS3
SAA2013
L3MODE
L3CLK
L3DATA
FDAI
FDAO
FDWS
FDCL
FSYNC
FRESET
FDIR
LRMODEC
LRCLKC
LRDATAC
7610
FDAO
FDAI
FDWS
FDCL
FSYNC
SYNCDAI
FDIR
LRMODE
LRCLK
LRDATA
SBDIR
SBDA
SBCL
SBWS
SBEF
SFC3
SAA2003
SWS
SCK
SDA1
SDA2
24,576 MHz
22,5792 MHz
DAC CONTROL
7730
L3DATA
L3DATA_IN
L3DATA_OUT
SDA1
SD
SDAD
SDDAC
SDA2
SD
I2S
7760
CONTROL2
CONTROL1
CONTROL0
DAC
TDA1305T
DACL
DACR
SDDAC
SWS
SCK
ANALOG OUT LEFT
ANALOG OUT RIGHT
7780
ADC
SAA7366
SDAD
SWS
SCK
LEFT IN
RIGHT IN
ANALOG IN LEFT
ANALOG IN RIGHT
7500
TAPE DRIVE UP
P87C52EBPN
N_FAIL_P
N_FAIL_P
MSYNC
RXD
TXD
RESET_UP
N_DCC_REC_PROT
DRIVER_S0/S1/S2
WIND_SPEED
S/T REEL
SWITCHES
N_SOLP
N_SOL
N_CAPON
7700
MAIN UP
UPD78P056GC
MSYNC
RXD
TXD
RESET_UP
N_DCC_REC_PROT
L3MODE
L3DATA_OUT
L3DATA_IN
L3REF
L3INT
L3_RCV
SLAVE-OUT
SLAVE_IN
MESSYNC
NRESET
CLOCK
HOLD
7580
7570
7505
DC
DC
7510
SOLENOID CONTROL
CAPSTAN MOTOR CONTROL
SPEED
M
WIND MOTOR
M101
SOLENOID
L101
M
CAPSTAN MOTOR
M102
ACC L+R
CONTROLLER INTERFACE
POWER
TACHO SUPPLY REEL
TACHO TAKE-UP REEL
DECK & LOADER SWITCHES
DCC CASSETTE PRESENT SW101
DCC RECORD PROTECT SW102
DCC TAPE LENGTH HOLE3 SW103
DCC TAPE LENGTH HOLE4 SW104
DCC TAPE LENGTH HOLE5 SW105
PLAY POSITION SW110
CRO2/NORMAL SW111
CASSETTE PRESENT SW112

WIRING DIAGRAM DCC DECK


T_REEL
S_REEL
4
3
1
2
470R
1502_1
1502_2
1502_3
1502_4
1502_5
1502_6
1502_7
1502_8
1502_9
1502_10
1502_11
1502_12
1502_13
1502_14
TREEL
SREEL
N CASS PRES
CRO2/TRAY OPEN
DCC CASS PRES
N DCC REC PROT
N HOLE 3
N HOLE4
N HOLE5
N QREV PRES
QUICK REVERSE
+5VD
GNDD
N PLAY POS
SW112
PACK_IN_SW
SW111
CRO2/NORMAL_SW
and TRAY_OPEN
SW101
DCC/ACC_SW
SW102
SW103
PH3(PLAYING_TIME)
SW104
PH4(PLAYING_TIME)
SW105
PH5(PLAYING_TIME)
SW110
PLAY_SW
TAPE DRIVE CONTROL
1503_1
1503_2
WIND-
WIND+
REEL
WIND
MOTOR
M101
1503_3
1503_4
PLAY MAG
+10VD
SOLENOID
L101
1504_2
1504_3
1504_4
1504_1
CAPSTAN+
CAP_A
CAP_B
CAPSTAN-
CAPSTAN
CAPSTAN
MOTOR
M102


ALL CONNECTORS ARE 1 TO 1 CONNECTED

WIRING DIAGRAM FLAP LOADER


8003
8004
WIND
MOTOR
SW112
SW111
M101
S_REEL
T_REEL
SW101
SW102
SOLENOID
L101
CAPSTAN
MOTOR
M102
SW110
DCC DECK
SW103
SW104
SW105
1800
READ/WRITE PCB
1801
4
1
14
1
4
1
NOT IN USE
1503
1502
1504
TAPE DRIVE CONTROL PCB
11
1505
1
8002
1 3 1 7 1 5 1 7
1604
1600
1601
1603
1605
1606
10
1
1602
1
12
DIGITAL
PCB
ANALOG
IN/OUT
ACC
L+R
ONLY FOR
3104 117 0056
OPTICAL IN
DIGITAL IN/OUT
POWER
SUPPLY
CONTROLLER
INTERFACE

1502	
1	TREEL
2	SREEL
3	N_CASS_PRES
4	CRO2/TRAY/OPEN
5	DCC_CAS_PRES
6	N_DCC_REC_PROT
7	N_HOLE3
8	N_HOLE4
9	N_HOLE5
10	N_QREV_PRES
11	QUICK_REVERSE
12	+5VD
13	GNDD
14	N_PLAY_POS

1503	
1	WIND-
2	WIND+
3	PLAY_MAG-
4	+10VD

1504	
1	CAPSTAN-
2	CAPSTAN+
3	CAP_A
4	CAP_B

1801 - 1603	
1	GNDD
2	WDATA
3	GNDD
4	CHROME
5	GNDA
6	ANAR
7	GNDA
8	ANAL
9	WRITE_STNDBY
10	ACC/NDCC
11	RDMUX
12	GNDD
13	RDSYNC
14	GNDD
15	TCLOCK
16	GNDD
17	+5VD
18	+10VD

1800	
1	TXD
2	WX-
3	RX+
4	WX0
5	R0+
6	W01
7	R1+
8	W12
9	R2+
10	W23
11	R3+
12	W34
13	COD
14	W45
15	R4+
16	W56
17	R5+
18	W67
19	R6+
20	W7-
21	R7+
22	TD2
23	TA8
24	A2+
25	TA9
26	TA1
27	A1+
28	COA
29	TA2
30	SHIELD

1505 - 1602	
1	MSYNC
2	N_FAILP
3	GNDS
4	+10VD
5	RESET_UP
6	SPEED
7	RXD
8	+5VD
9	TXD
10	NDCC_REC_PROT
11	GNDD

1604	
1	ANAL
2	GNDA
3	ANAR

1601	
1	N_FAILP
2	GNDD
3	+5VD
4	GNDS
5	+10VD

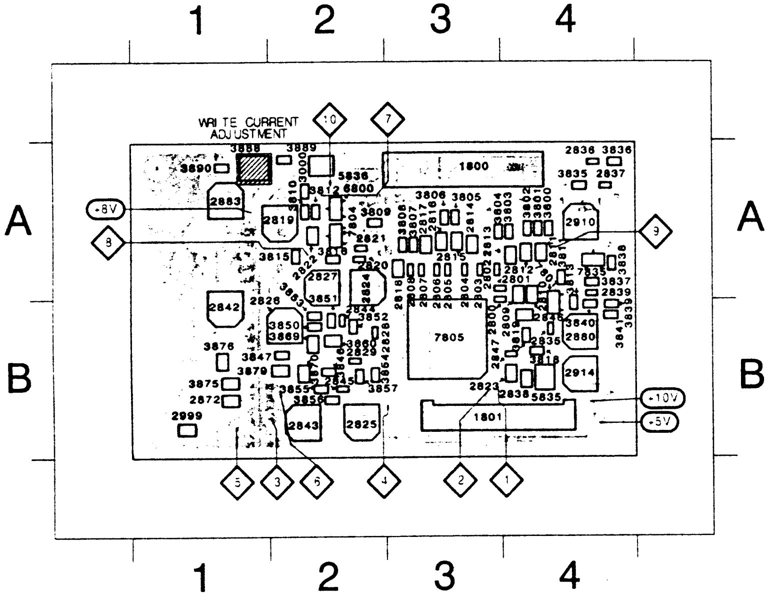
1606	
1	LEFTINPUT
2	GNDA
3	RIGHTINPUT
4	GNDA
5	NMUTE
6	DACR
7	GNDA
8	+5VA
9	GNDA
10	DACL

1605	
1	SLAVE_OUT
2	GNDD
3	MESSYNC
4	SLAVE_IN
5	NRESET
6	CLOCK
7	HOLD

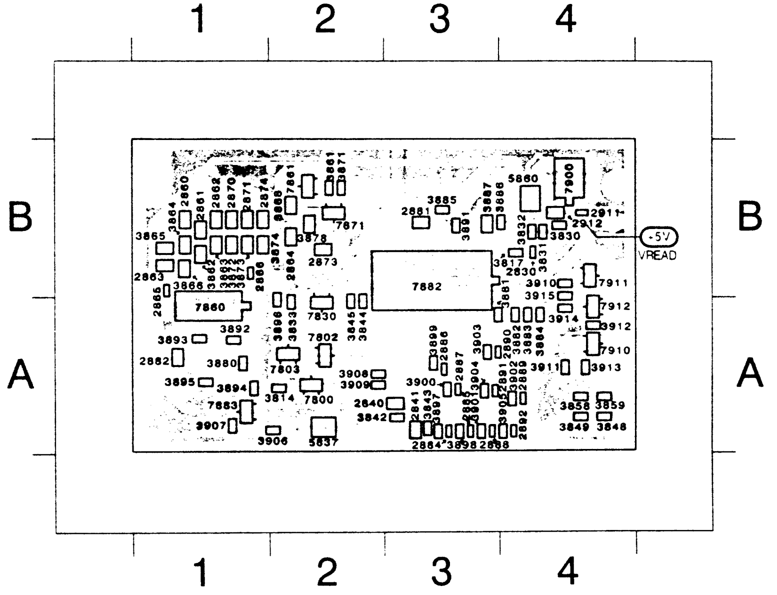
1600	
1	GNDD
2	OPTICALIN
3	GNDD
4	COAXIALIN
5	+5VD
6	DIGITALOUT
7	GNDD

READ/WRITE PANEL

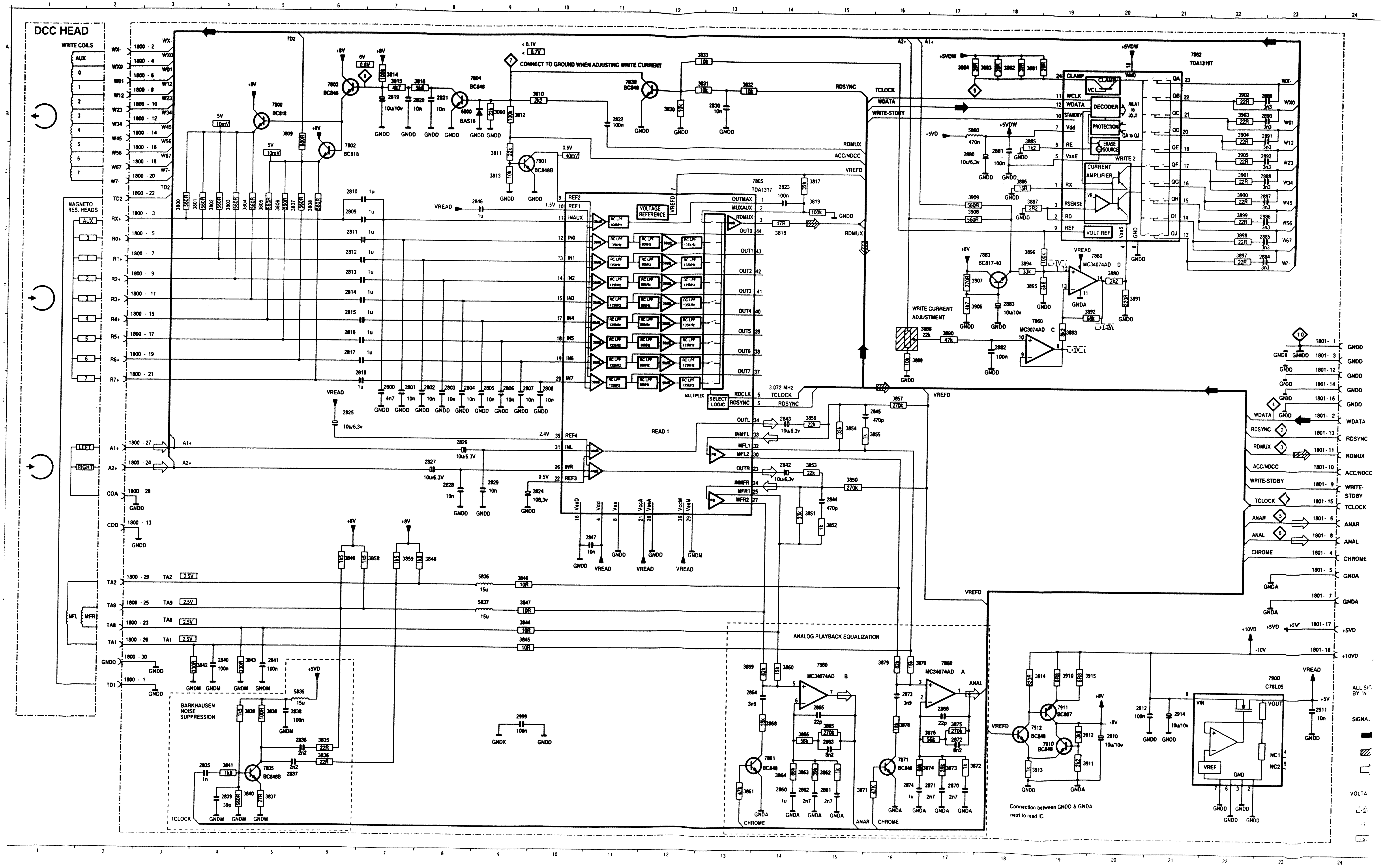
1800 A 3	2813 A 4	2828 B 2	2883 A 1	3810 A 2	3846 B 2	3879 B 2
1801 B 3	2814 A 3	2829 B 2	2910 A 4	3811 A 4	3847 B 2	3888 A 1
2800 B 3	2815 A 3	2835 B 4	2914 B 4	3812 A 2	3850 B 2	3889 A 2
2801 A 3	2816 A 3	2836 A 4	2999 B 1	3813 B 4	3851 B 2	3890 A 1
2802 A 3	2817 A 3	2837 A 4	3000 A 2	3815 A 2	3852 B 2	5835 B 4
2803 A 3	2818 A 3	2838 B 4	3800 A 4	3816 A 2	3853 B 2	5836 A 2
2804 A 3	2819 A 2	2839 A 4	3801 A 4	3818 B 4	3854 B 2	6800 A 2
2805 A 3	2820 A 2	2842 B 1	3802 A 4	3819 B 4	3855 B 2	7801 B 4
2806 A 3	2821 A 2	2843 B 2	3803 A 4	3835 A 4	3856 B 2	7804 A 2
2807 A 3	2822 A 2	2844 B 2	3804 A 3	3836 A 4	3857 B 2	7805 B 3
2808 A 3	2823 B 4	2845 B 2	3805 A 3	3837 A 4	3860 B 2	7835 A 4
2809 A 4	2824 A 2	2846 B 4	3806 A 3	3838 A 4	3869 B 2	
2810 A 4	2825 B 2	2847 B 4	3807 A 3	3839 B 4	3870 B 2	
2811 A 4	2826 B 2	2872 B 1	3808 A 3	3840 B 4	3875 B 1	
2812 A 4	2827 A 2	2880 B 4	3809 A 2	3841 B 4	3876 B 1	

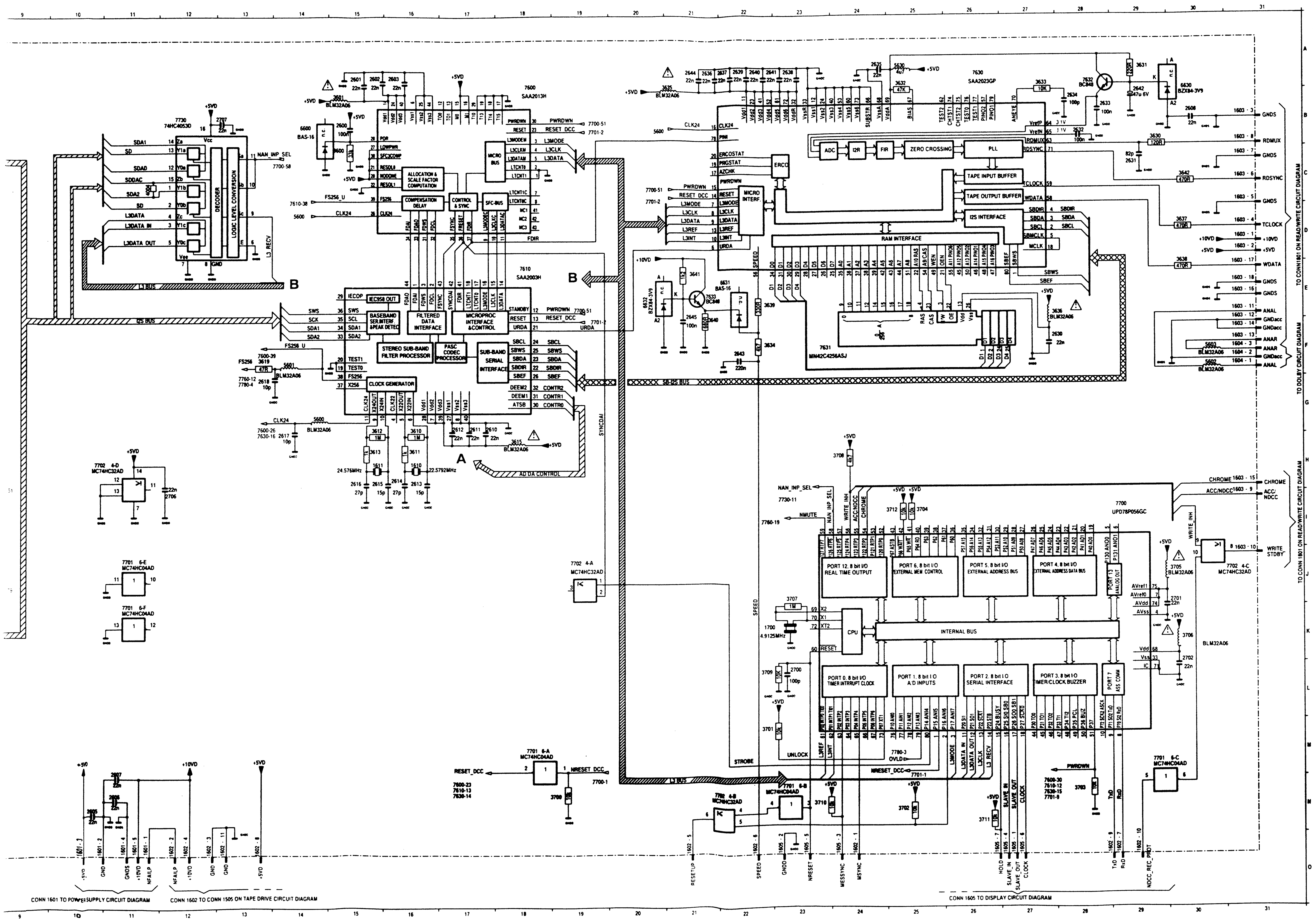


2830 B 4	2882 A 1	3831 B 4	3865 B 1	3887 B 3	3905 A 4	7803 A 2
2840 A 3	2884 A 3	3832 B 4	3866 B 1	3891 B 3	3906 A 2	7830 A 2
2841 A 3	2885 A 3	3833 A 2	3868 B 2	3892 A 1	3907 A 1	7860 A 1
2860 B 1	2886 A 3	3842 A 3	3871 B 2	3893 A 1	3908 A 2	7861 B 2
2861 B 1	2887 A 3	3843 A 3	3872 B 1	3894 A 1	3909 A 2	7871 B 2
2862 B 1	2888 A 3	3844 A 2	3873 B 1	3895 A 1	3910 B 4	7882 B 3
2863 B 1	2889 A 4	3845 A 2	3874 B 1	3896 A 2	3911 A 4	7883 A 1
2864 B 2	2890 A 3	3848 A 4	3878 B 2	3897 A 3	3912 A 4	7900 B 4
2865 B 1	2891 A 3	3849 A 4	3880 A 1	3898 A 3	3913 A 4	7910 A 4
2866 B 1	2892 A 4	3858 A 4	3881 A 3	3899 A 3	3914 A 4	7911 B 4
2870 B 1	2911 B 4	3859 A 4	3882 A 4	3900 A 3	3915 B 4	7912 A 4
2871 B 1	2912 B 4	3861 B 2	3883 A 4	3901 A 3	5837 A 2	
2873 B 2	3814 A 2	3862 B 1	3884 A 4	3902 A 4	5860 B 4	
2874 B 1	3817 B 4	3863 B 1	3885 B 3	3903 A 3	7800 A 2	
2881 B 3	3830 B 4	3864 B 1	3886 B 4	3904 A 3	7802 A 2	



READ/WRITE CIRCUIT DIAGRAM

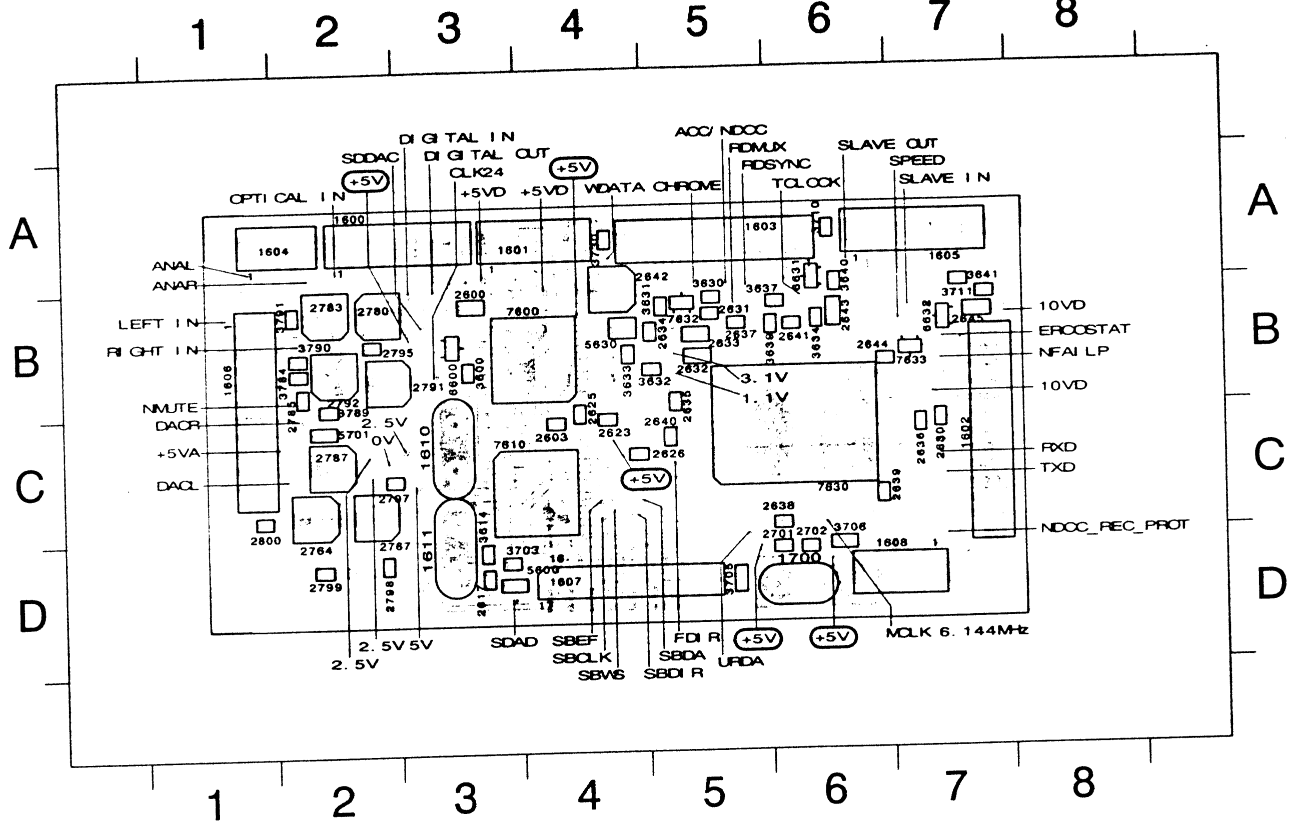

DCC HEAD
WRITE COILS
AUX
MAGNETO RES. HEADS
LEFT
RIGHT
MFL
MFR
WX-
WX0
W01
W12
W23
W34
W45
W56
W67
W7-
TD2
RX+
R0+
R1+
R2+
R3+
R4+
R5+
R6+
R7+
A1+
A2+
COA
COD
TA2
TA9
TA8
TA1
GNDD
TD1
TD2
7800 BC818
7802 BC818
7803 BC848
7804 BC848
6800 BAS16
7801 BC848B
7830 BC848
CONNECT TO GROUND WHEN ADJUSTING WRITE CURRENT
< 0.1V
< 0.7V
+8V
6V
5V
10mV
0.6V
40mV
RDSYNC
TCLOCK
WDATA
WRITE-STDBY
RDMUX
ACC/NDCC
VREFD
VREAD
7805 TDA1317
VOLTAGE REFERENCE
REF2
REF1
INAUX
IN0
IN1
IN2
IN3
IN4
IN5
IN6
IN7
OUTMAX
MUXAUX
RDMUX
OUT0
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
MULTIPLEX
SELECT LOGIC
RDCLK
RDSYNC
3.072 MHz
READ 1
REF4
INL
INR
REF3
OUTL
INMFL
MFL1
MFL2
OUTR
INMFR
MFR1
MFR2
VeeD
Vdd
Vss
VccA
VeeA
VccM
VeeM
7882 TDA1319T
+5VDW
CLAMP
VCL
WCLK
WDATA
STANDBY
Vdd
RE
VssE
RX
RSENSE
RD
REF
DECODER
PROTECTION
ERASE SOURCE
CURRENT AMPLIFIER
WRITE 2
VOLT.REF
QA
QB
QC
QD
QE
QF
QG
QH
QI
QJ
A0,A1 to J0,J1
QA to QJ
7883 BC817-40
7860 MC34074AD D
7860 MC34074AD C
WRITE CURRENT ADJUSTMENT
GNDA
GNDD
GNDM
GNDX
1801-1
1801-3
1801-12
1801-14
1801-16
1801-2
1801-13
1801-11
1801-10
1801-9
1801-15
1801-6
1801-8
1801-4
1801-5
1801-7
1801-17
1801-18
WDATA
RDSYNC
RDMUX
ACC/NDCC
WRITE-STDBY
TCLOCK
ANAR
ANAL
CHROME
+5VD
+10VD
+5V
BARKHAUSEN NOISE SUPPRESSION
7835 BC848B
ANALOG PLAYBACK EQUALIZATION
7860 MC34074AD B
7860 MC34074AD A
7861 BC848
7871 BC848
7911 BC807
7912 BC848
7910 BC848
7900 C78L05
VIN
VOUT
VREF
GND
NC1
NC2
Connection between GNDD & GNDA next to read IC.
ALL SIG BY 'N
SIGNAL
VOLTA


7730 74HC4053D
DECODER
LOGIC LEVEL CONVERSION
NAN_INP_SEL
L3 RECV
L3 BUS
I2S BUS
B
7600 SAA2013H
ALLOCATION & SCALE FACTOR COMPUTATION
COMPENSATION DELAY
CONTROL & SYNC
SFC-BUS
MICRO BUS
7610 SAA2003H
IEC958 OUT
BASEBAND SER.INTERF. &PEAK DETEC
FILTERED DATA INTERFACE
MICROPROC INTERFACE &CONTROL
STEREO SUB-BAND FILTER PROCESSOR
PASC CODEC PROCESSOR
SUB-BAND SERIAL INTERFACE
CLOCK GENERATOR
24.576MHz
22.5792MHz
A
AD DA CONTROL
SYNCDAI
7630 SAA2023GP
ERCO
MICRO INTERF.
ADC
I2R
FIR
ZERO CROSSING
PLL
TAPE INPUT BUFFER
TAPE OUTPUT BUFFER
I2S INTERFACE
RAM INTERFACE
7631 MN42C4256ASJ
SB-I2S BUS
7632 BC848
7633 BC848
6630 BZX84-3V9
6632 BZX84-3V9
6631 BAS-16
6600 BAS-16
7700 UPD78P056GC
PORT 12. 8 bit I/O REAL TIME OUTPUT
PORT 6. 8 bit I/O EXTERNAL MEM CONTROL
PORT 5. 8 bit I/O EXTERNAL ADDRESS BUS
PORT 4. 8 bit I/O EXTERNAL ADDRESS DATA BUS
PORT 13 ANALOG OUT
CPU
INTERNAL BUS
PORT 0. 8 bit I/O TIMER INTRRUPT CLOCK
PORT 1. 8 bit I/O A/D INPUTS
PORT 2. 8 bit I/O SERIAL INTERFACE
PORT 3. 8 bit I/O TIMER/CLOCK BUZZER
PORT 7 ASS COMM
1700 4.9125MHz
7702 4-D MC74HC32AD
7702 4-A MC74HC32AD
7702 4-B MC74HC32AD
7702 4-C MC74HC32AD
7701 6-E MC74HC04AD
7701 6-F MC74HC04AD
7701 6-A MC74HC04AD
7701 6-B MC74HC04AD
7701 6-C MC74HC04AD
RESET_DCC
NRESET_DCC
GNDS
RDMUX
RDSYNC
TCLOCK
+10VD
+5VD
WDATA
ANAL
GNDacc
ANAR
CHROME
ACC/NDCC
WRITE STDBY
TO CONN1801 ON READ/WRITE CIRCUIT DIAGRAM
TO DOLBY CIRCUIT DIAGRAM
TO CONN 1801 ON READ/WRITE CIRCUIT DIAGRAM
+5VD
GND
GNDS
+10VD
NFAILP
GND
RESETUP
SPEED
GNDD
NRESET
MESSYNC
MSYNC
HOLD
SLAVE_IN
SLAVE_OUT
CLOCK
TxD
RxD
NDCC_REC_PROT
CONN 1601 TO POWER SUPPLY CIRCUIT DIAGRAM
CONN 1602 TO CONN 1505 ON TAPE DRIVE CIRCUIT DIAGRAM
CONN 1605 TO DISPLAY CIRCUIT DIAGRAM

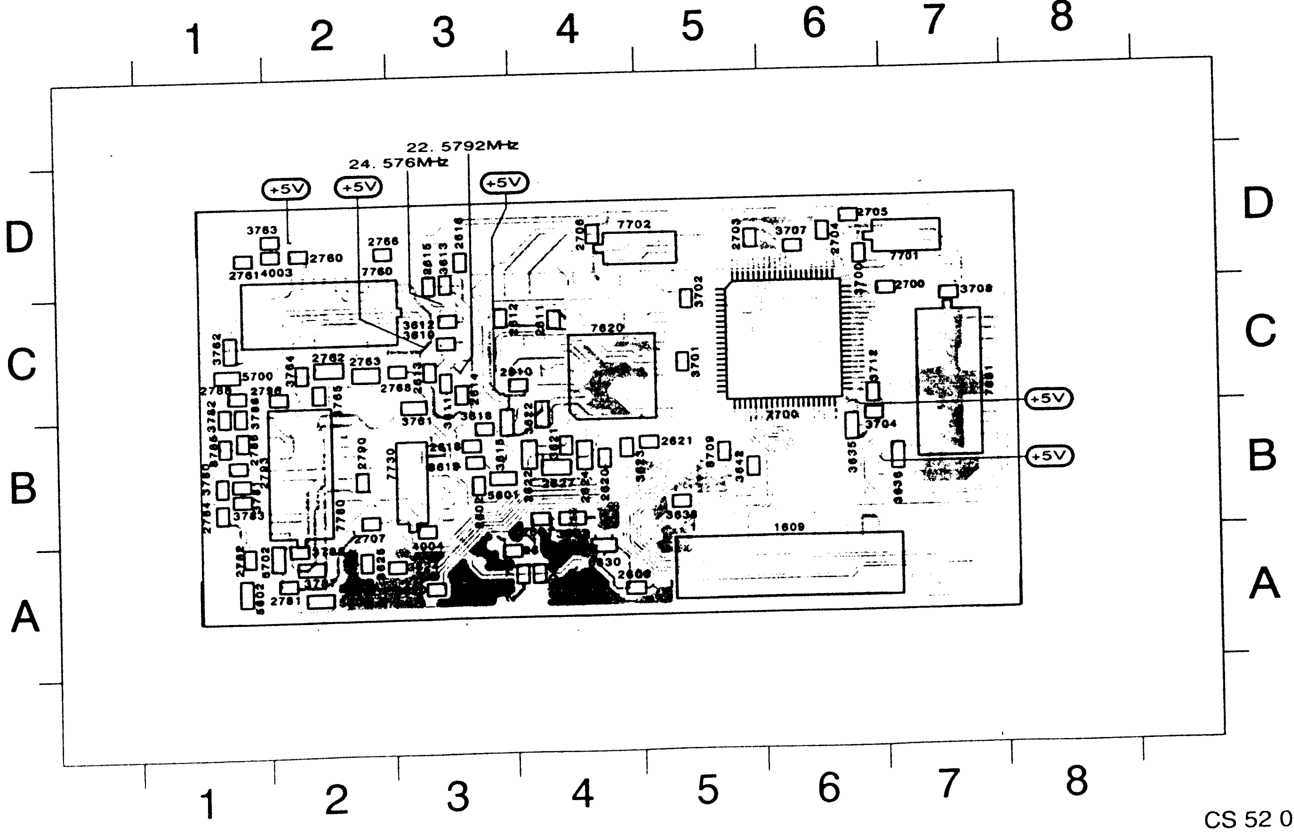
1601	O11
1601	O10
1601	O10
1601	O11
1601	O11
1602	O24
1602	O12
1602	O12
1602	O12
1602	O21
1602	O22
1602	O29
1602	O13
1602	O28
1602	O29
1602	O13
1603	D31
1603	D31
1603	B31
1603	D31
1603	C31
1603	C31
1603	C31
1603	B31
1603	I31
1603	J31
1603	E31
1603	E31
1603	F31
1603	F31
1603	H31
1603	E31
1603	E31
1603	E31
1604	F31
1604	F31
1604	F31
1605	O27
1605	O23
1605	O24
1605	O27
1605	O23
1605	O27
1605	O26
1606	K 1
1606	K 1
1606	I 1
1606	I 1
1606	A 1
1606	E 1
1606	E 1
1606	F 1
1606	G 1
1606	G 1
1610	H16
1611	H15
1700	K22
2600	B15
2601	A15
2602	A15
2603	A16
2605	N10
2606	N11
2607	M11
2608	B30
2610	G17
2611	G17
2612	G17
2613	H16
2614	H16
2615	H15
2616	H15
2617	G14
2618	G13
2630	F28
2631	C29
2632	B28
2633	B28
2634	B28
2635	A24
2636	A21
2637	A22
2638	A23
2639	A22
2640	A22
2641	A22
2642	B29
2643	F22
2644	A21
2645	E2[illegible]
2700	L[illegible]
2701	J30
2702	K30
2705	H 7
2706	I12
2707	B13
2760	D 2
2762	E 6
2763	E 2
2764	F 6
2766	F 3
2767	F 5
2768	G 5
2780	H 5
2781	I 5
2782	L 5
2783	L 4
2786	H 5
2787	H 4
2788	J 3
2790	I 7
2791	I 7
2792	J 2
2793	J 2
2795	I 8
2796	H 6
2797	G 5
2798	F 2
2799	D 1
2800	D 1
3600	C15
3601	B15
3610	G16
3611	H16
3612	G15
3613	H15
3615	H18
3619	F13
3630	B29
3631	A29
3632	A25
3633	A27
3634	F22
3635	A21
3636	E28
3637	D30
3638	E30
3639	E22
3640	E21
3641	E21
3642	C30
3700	N19
3701	M22
3702	N25
3703	N28
3704	I25
3705	J30
3706	K30
3707	J23
3708	H24
3709	L22
3710	N23
3711	N26
3712	I25
3761	G 6
3762	C 2
3764	A 3
3765	A 2
3780	K 3
3781	K 3
3782	I 3
3783	K 3
3784	I 3
3785	I 3
3786	J 3
3787	I 8
3788	J 2
3789	J 2
3790	I 2
3791	K 2
4004	C11
5600	G14
5601	F14
5602	F30
5603	F30
5630	A25
5700	G 2
5701	E 2
5702	H 5
6600	B14
6630	A30
6631	E22
6632	E20
7600	A18
7610	E18
7630	A26
7631	F24
7632	A28
7633	E21
7700	I29
7701	M18
7701	N23
7701	M29
7701	H 8
7701	J11
7701	J11
7702	J19
7702	N22
7702	J31
7702	H10
7730	B12
7760	B 2
7780	I 4

DIGITAL PANEL

1600 A 3	1607 D 4	2617 D 3	2633 B 5	2640 C 5	2702 D 6	2791 B 2	3600 B 3	3637 B 6	3710 A 6	5600 D 3	7610 C 4
1601 A 4	1608 D 7	2623 C 4	2634 B 5	2641 B 6	2764 C 2	2792 B 2	3614 D 3	3639 B 6	3711 B 7	5630 B 4	7630 C 6
1602 C 7	1610 C 3	2625 C 4	2635 B 5	2642 B 4	2767 C 2	2795 B 2	3630 B 5	3640 B 6	3730 A 4	5701 C 2	7632 B 5
1603 A 5	1611 D 3	2626 C 4	2636 C 7	2643 B 6	2780 B 2	2797 C 2	3631 B 5	3641 B 7	3784 B 2	6600 B 3	7633 B 7
1604 A 2	1700 D 6	2630 C 7	2637 B 5	2644 B 6	2783 B 2	2798 D 2	3632 B 5	3703 D 3	3789 B 2	6631 A 6	
1605 A 7	2600 B 3	2631 B 5	2638 C 6	2645 B 7	2785 B 2	2799 D 2	3633 B 4	3705 D 5	3790 B 2	6632 B 7	
1606 B 1	2603 C 4	2632 B 5	2639 C 6	2701 D 6	2787 C 2	2800 C 1	3634 B 6	3706 D 6	3791 B 2	7600 B 4	


1
2
3
4
5
6
7
8
A
B
C
D
DIGITAL IN
DIGITAL OUT
SDDAC
CLK24
+5V
OPTICAL IN
+5VD
WDATA
CHROME
ACC/NDCC
RDMUX
RDSYNC
TCLOCK
SLAVE OUT
SPEED
SLAVE IN
ANAL
ANAR
LEFT IN
RIGHT IN
NMUTE
DACR
+5VA
DACL
2.5V
0V
3.1V
1.1V
10VD
ERCOSTAT
NFAILP
RXD
TXD
NDCC_REC_PROT
MCLK 6.144MHz
SDAD
SBEF
SBCLK
SBWS
SBDA
SBDIR
FDIR
URDA
2.5V 5V
1604
1600
1601
1603
1605
7600
7610
7630
1610
1611
1607
1608
1602
1700

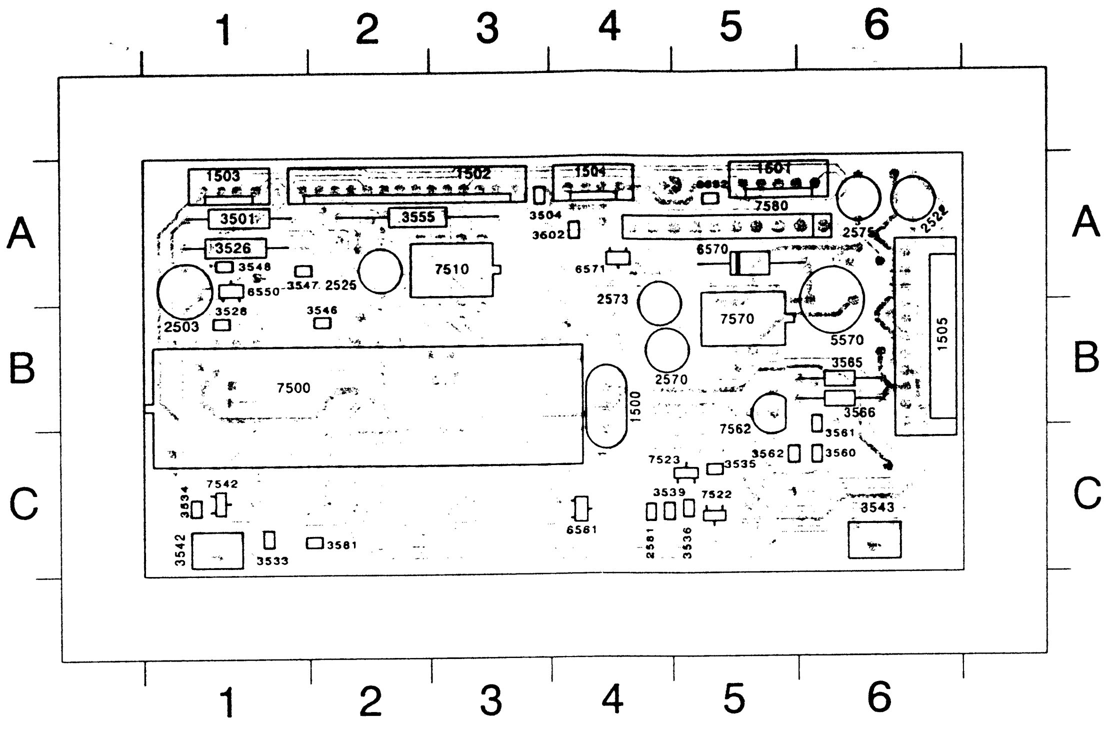
1609 B 6	2611 C 4	2621 B 5	2706 D 4	2781 A 2	3601 B 4	3620 A 3	3638 B 5	3709 B 5	3781 B 1	4004 B 3	7631 C 7
2601 B 4	2612 C 3	2622 B 4	2707 B 2	2782 A 1	3610 C 3	3621 B 4	3642 B 5	3712 C 6	3782 C 1	5601 B 3	7700 C 6
2602 B 3	2613 C 3	2624 B 4	2760 D 2	2784 B 1	3611 C 3	3622 B 4	3700 D 6	3761 C 3	3783 B 1	5602 A 1	7701 D 7
2605 A 3	2614 C 3	2627 B 4	2761 D 1	2786 B 1	3612 C 3	3623 B 4	3701 C 5	3762 C 1	3785 B 1	5603 A 2	7702 D 5
2606 A 4	2615 D 3	2700 C 7	2762 C 2	2788 C 1	3613 D 3	3624 A 3	3702 C 5	3763 D 2	3786 C 1	5700 C 1	7730 B 3
2607 A 4	2616 D 3	2703 D 5	2763 C 2	2790 B 2	3615 B 3	3625 A 2	3704 B 6	3764 C 2	3787 A 2	5702 A 2	7760 C 2
2608 A 4	2618 B 3	2704 D 6	2766 D 2	2793 B 1	3618 B 3	3635 B 6	3707 D 6	3765 C 2	3788 A 2	6630 A 4	7780 B 2
2610 C 4	2620 B 4	2705 D 6	2768 C 3	2796 C 2	3619 B 3	3636 B 7	3708 C 7	3780 B 1	4003 D 2	7620 C 4	


1
2
3
4
5
6
7
8
D
C
B
A
22.5792MHz
24.576MHz
+5V
3763
2760
2761
4003
2766
7760
7702
2705
3707
2704
7701
2700
3708
7620
3701
3702
7700
3704
+5V
7730
7780
1609
3636

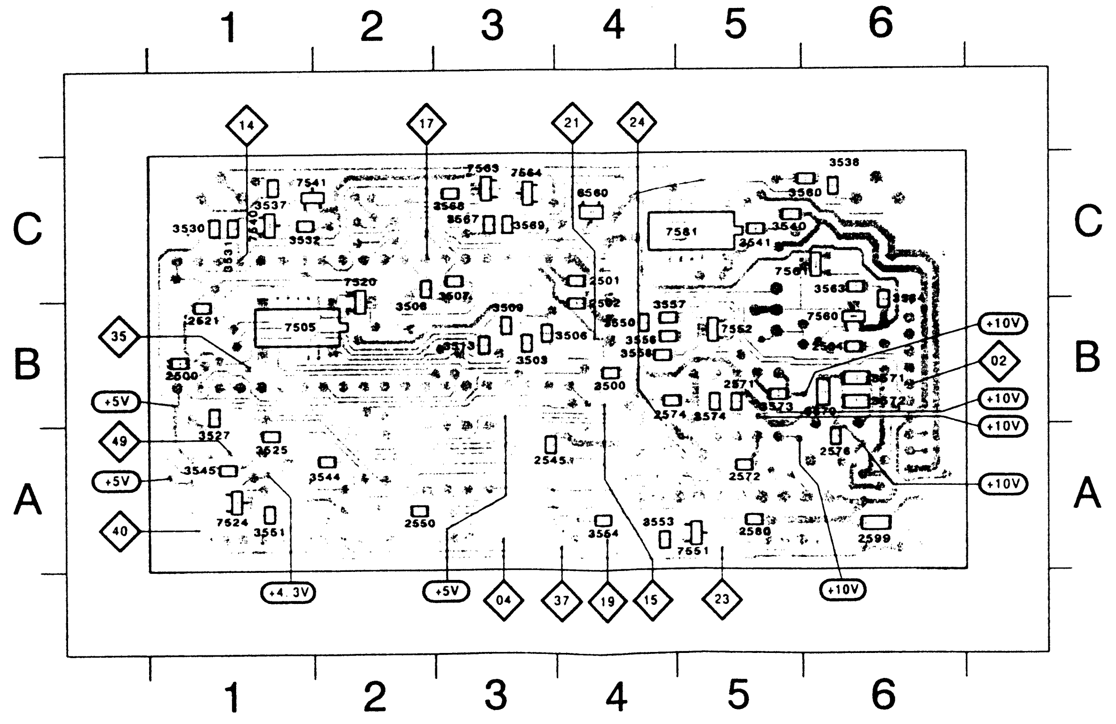
CS 52 089

TAPE DRIVE CONTROL PANEL

1500 B 4	1505 B 6	2573 B 4	3504 A 3	3535 C 5	3546 B 2	3560 C 6	3581 C 2	6571 A 4	7542 C 1
1501 A 5	2503 A 1	2575 A 6	3526 A 1	3536 C 5	3547 A 1	3561 B 6	5570 B 6	7500 B 2	7562 B 5
1502 A 2	2522 A 6	2581 C 4	3528 B 1	3539 C 4	3548 A 1	3562 C 5	6550 A 1	7510 A 3	7570 B 5
1503 A 1	2525 A 2	3501 A 1	3533 C 1	3542 C 1	3552 A 5	3565 B 6	6561 C 4	7522 C 5	7580 A 5
1504 A 4	2570 B 4	3502 A 4	3534 C 1	3543 C 6	3555 A 2	3566 B 6	6570 A 5	7523 C 5	


1
2
3
4
5
6
A
B
C
1503
1502
1504
1501
7580
3501
3555
3526
3504
3602
6571
6570
2575
2522
3548
6550
3547
2526
7510
3528
3546
2573
7570
2503
1505
7500
1500
2570
5570
3565
3566
7562
3561
3562
3560
7523
3535
7542
3534
7522
3539
3536
2581
3542
3533
3581
6561
3543

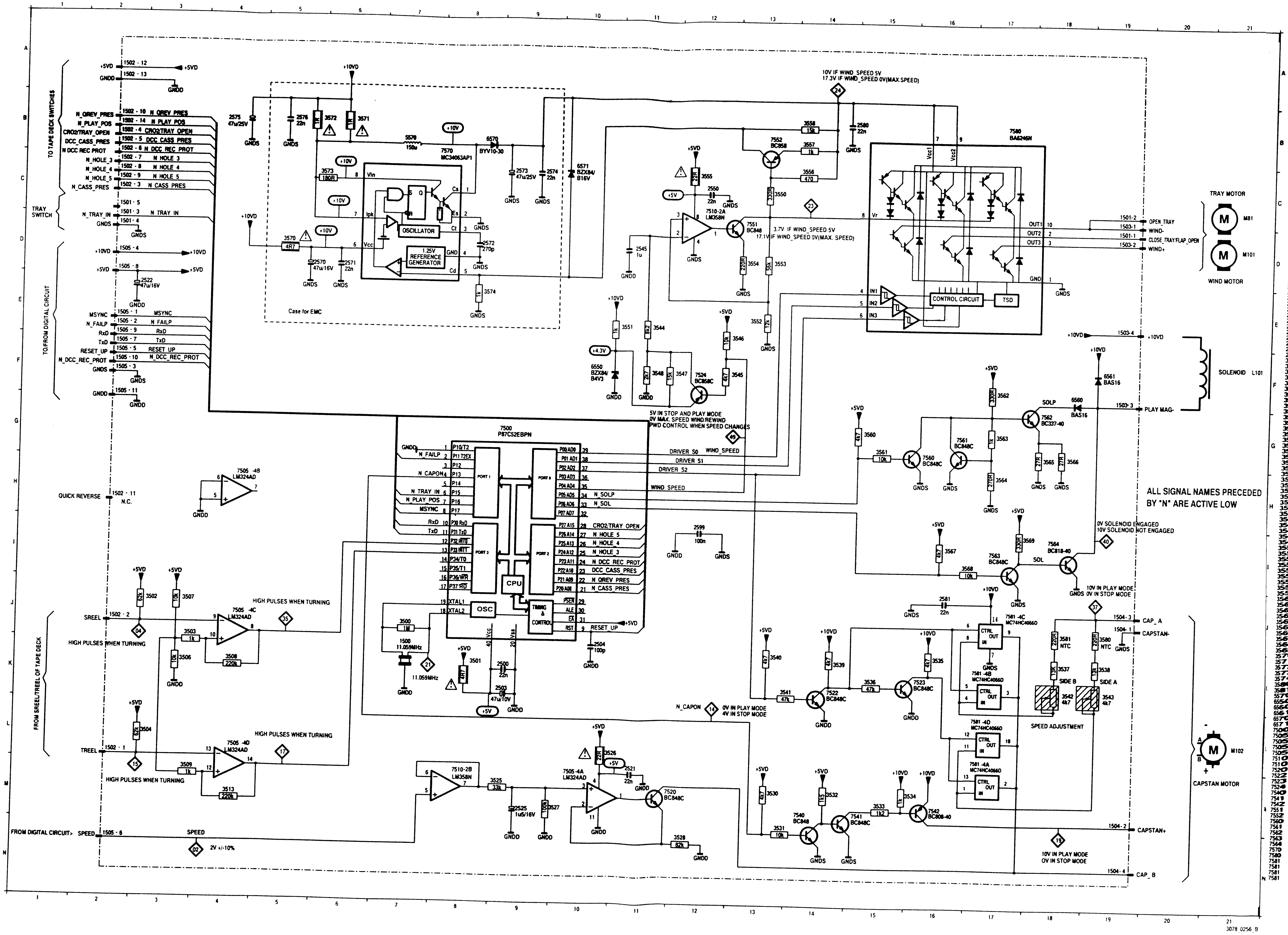
2500 B 1	2571 B 5	3503 B 3	3527 B 1	3541 C 5	3556 B 4	3569 C 3	6560 C 4	7552 B 5
2501 C 4	2572 A 5	3506 B 3	3530 C 1	3544 A 2	3557 B 4	3570 B 6	7505 B 1	7560 B 6
2502 B 4	2574 B 4	3507 C 3	3531 C 1	3545 A 1	3558 B 4	3571 B 6	7520 B 2	7561 C 6
2504 B 6	2576 A 6	3508 C 2	3532 C 1	3550 B 4	3563 C 6	3572 B 6	7524 A 1	7563 C 3
2521 B 1	2580 A 5	3509 B 3	3537 C 1	3551 A 1	3564 B 6	3573 B 5	7540 C 1	7564 C 3
2545 A 3	2599 A 6	3513 B 3	3538 C 6	3553 A 4	3567 C 3	3574 B 5	7541 C 1	7581 C 5
2550 A 2	3500 B 4	3525 A 1	3540 C 5	3554 A 4	3568 C 3	3580 C 6	7551 A 5	


1
2
3
4
5
6
C
B
A
14
17
21
24
35
+5V
49
+5V
40
+10V
02
+10V
+10V
+10V
+4.3V
+5V
04
37
19
15
23
+10V
7541
7563
7564
6560
7561
7505
7520
2500
3527
3545
7524
3551
3544
2550
2545
3564
3553
7551
2572
2580
2599
3538

CS 52 090

11-17

TAPE DRIVE CONTROL CIRCUIT DIAGRAM


TO TAPE DECK SWITCHES
TRAY SWITCH
TO/FROM DIGITAL CIRCUIT
FROM SREEL/TREEL OF TAPE DECK
FROM DIGITAL CIRCUIT> SPEED
+5VD
GNDD
N_QREV_PRES
N_PLAY_POS
CRO2/TRAY_OPEN
DCC_CASS_PRES
N DCC REC PROT
N_HOLE_3
N_HOLE_4
N_HOLE_5
N_CASS_PRES
N_TRAY_IN
+10VD
MSYNC
N_FAILP
RxD
TxD
RESET_UP
N_DCC_REC_PROT
GNDS
QUICK REVERSE
N.C.
SREEL
TREEL
SPEED
2V +/-10%
HIGH PULSES WHEN TURNING
Case for EMC
7570
MC34063AP1
OSCILLATOR
1.25V REFERENCE GENERATOR
BYV10-30
BZX84/ B16V
7500
P87C52EBPN
PORT 1
PORT 0
PORT 3
PORT 2
CPU
OSC
TIMING & CONTROL
11.059MHz
7505 -4B LM324AD
7505 -4C LM324AD
7505 -4D LM324AD
7505 -4A LM324AD
7510-2B LM358N
7510-2A LM358N
7520 BC848C
7524 BC858C
7551 BC848
7552 BC858
10V IF WIND_SPEED 5V
17.3V IF WIND_SPEED 0V(MAX.SPEED)
3.7V IF WIND_SPEED 5V
17.1V IF WIND_SPEED 0V(MAX. SPEED)
5V IN STOP AND PLAY MODE
0V MAX. SPEED WIND/REWIND
PWD CONTROL WHEN SPEED CHANGES
DRIVER S0
DRIVER S1
DRIVER S2
WIND_SPEED
N_SOLP
N_SOL
N_CAPON
0V IN PLAY MODE
4V IN STOP MODE
7580
BA6246N
CONTROL CIRCUIT
TSD
OPEN_TRAY
WIND-
CLOSE_TRAY/FLAP_OPEN
WIND+
TRAY MOTOR
M81
WIND MOTOR
M101
SOLENOID L101
PLAY MAG-
SOLP
SOL
6560 BAS16
6561 BAS16
7560 BC848C
7561 BC848C
7562 BC337-40
7563 BC848C
7564 BC818-40
ALL SIGNAL NAMES PRECEDED BY "N" ARE ACTIVE LOW
0V SOLENOID ENGAGED
10V SOLENOID NOT ENGAGED
10V IN PLAY MODE
0V IN STOP MODE
7581 -4C MC74HC4066D
7581 -4B MC74HC4066D
7581 -4D MC74HC4066D
7581 -4A MC74HC4066D
CTRL OUT IN
NTC
SIDE B
SIDE A
SPEED ADJUSTMENT
CAP_A
CAPSTAN-
CAPSTAN+
CAP_B
CAPSTAN MOTOR
M102
7522 BC848C
7523 BC848C
7540 BC848
7541 BC848C
7542 BC808-40
3078 0256 B

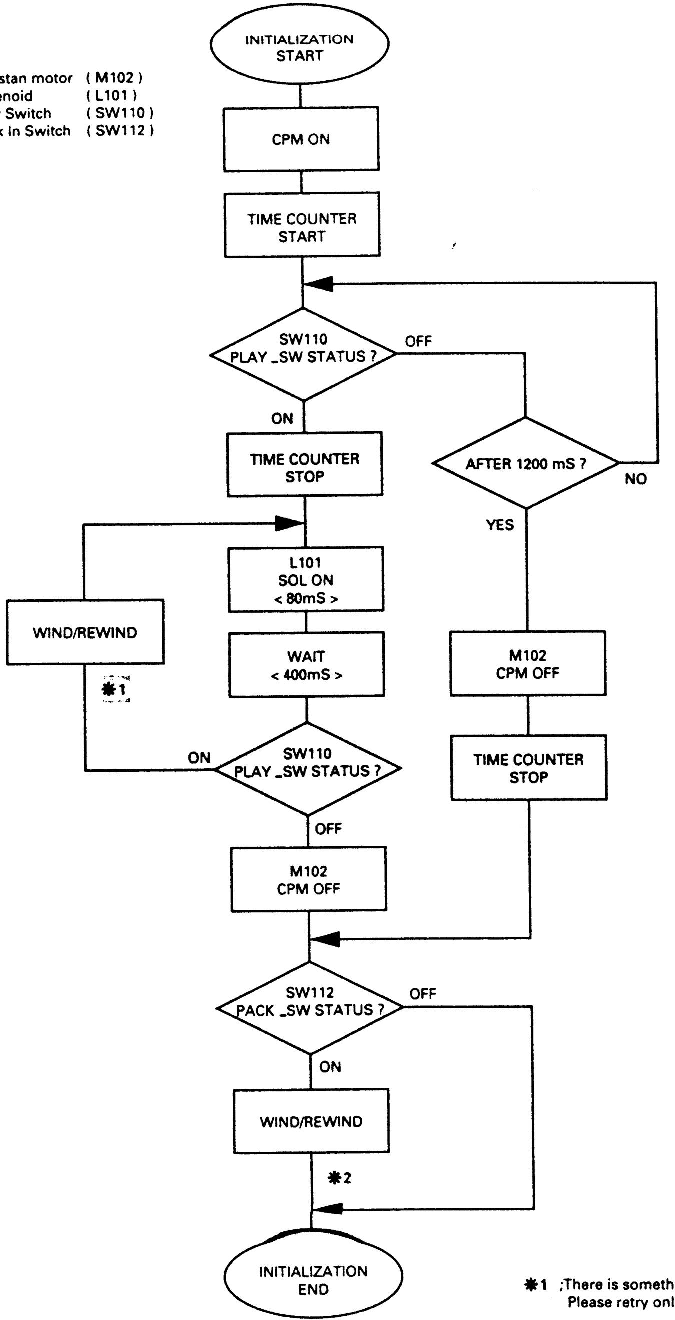
1500	K 7
1501	D19
1501	C19
1501	D 2
1501	D 2
1501	C 2
1502	L 2
1502	J 2
1502	C 2
1502	B 2
1502	B 2
1502	C 2
1502	C 2
1502	C 2
1502	C 2
1502	B 2
1502	H 2
1502	A 2
1502	A 2
1502	B 2
1503	C19
1503	D19
1503	F19
1503	E19
1504	J19
1504	M19
1504	J19
1504	N19
1505	E 2
1505	E 2
1505	F 2
1505	D 2
1505	F 2
1505	N 2
1505	F 2
1505	D 2
1505	F 2
1505	F 2
1505	G 2
2500	K 9
2503	K 9
2504	K10
2521	M11
2522	E 3
2525	M 9
2545	D11
2550	C12
2570	D 5
2571	D 6
2572	D 8
2573	C 9
2574	C 9
2575	B 4
2576	B 5
2580	B15
2581	J16
2599	I12
3500	J 7
3501	K 8
3502	J 3
3503	J 3
3504	L 3
3506	K 3
3507	J 3
3508	K 4
3509	M 3
3513	M 4
3525	M 9
3526	L11
3527	M10
3528	N12
3530	M13
3531	N13
3532	M14
3533	M15
3534	M16
3535	K16
3536	K15
3537	K18
3538	K19
3539	K14
3540	K13
3541	K13
3542	K18
3543	K19
3544	E11
3545	F12
3546	E12
3547	F11
3548	F11
3550	C13
3551	E11
3552	E13
3553	D13
3554	D13
3555	C12
3556	C14
3557	B14
3558	B14
3560	G15
3561	G15
3562	F17
3563	G17
3564	H17
3565	G18
3566	G18
3567	I16
3568	I16
3569	I18
3570	D 5
3571	B 6
3572	B 5
3573	C 6
3574	E 8
3580	J19
3581	J18
5570	B 7
6550	F10
6560	F18
6561	F19
6570	B 8
6571	C10
7500	G 9
7505	M10
7505	H 4
7505	J 4
7505	L 4
7510	C12
7510	M 8
7520	M11
7522	K14
7523	K16
7524	F12
7540	M14
7541	M15
7542	M16
7551	D13
7552	B13
7560	G16
7561	G16
7562	G18
7563	I17
7564	I18
7570	B 7
7580	B17
7581	L17
7581	K17
7581	J17
7581	L17

FLOW CHART TAPE DECK TIMING

LEGEND

< SYMBOLS>

CPM	;	Capstan motor	(M102)
SOL	;	Solenoid	(L101)
PLAY_SW	;	Play Switch	(SW110)
PACK_SW	;	Pack In Switch	(SW112)

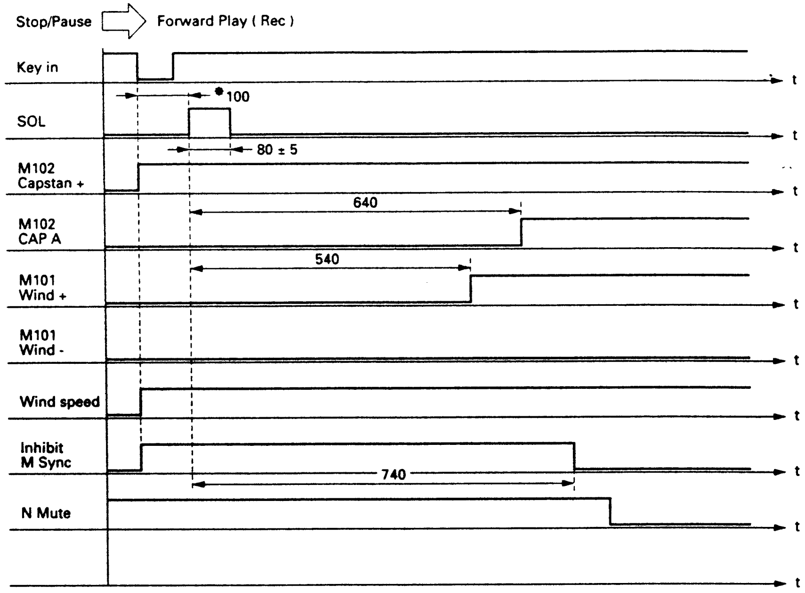

INITIALIZATION START
CPM ON
TIME COUNTER START
SW110 PLAY_SW STATUS ?
OFF
ON
TIME COUNTER STOP
AFTER 1200 mS ?
NO
YES
L101 SOL ON < 80mS >
WAIT < 400mS >
WIND/REWIND
✱1
M102 CPM OFF
TIME COUNTER STOP
SW110 PLAY_SW STATUS ?
ON
OFF
M102 CPM OFF
SW112 PACK_SW STATUS ?
OFF
ON
WIND/REWIND
✱2
INITIALIZATION END

✱1 ;There is something wrong.
Please retry only one time.

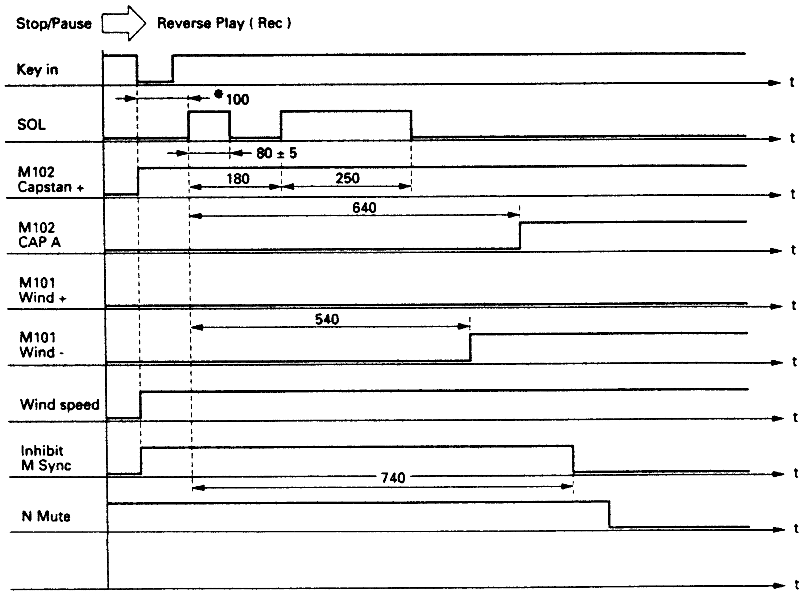
✱2 ;Please remove the slack of tape.

TAPE DECK TIMING CHARTS

TAPE DECK TIMING CHART 1

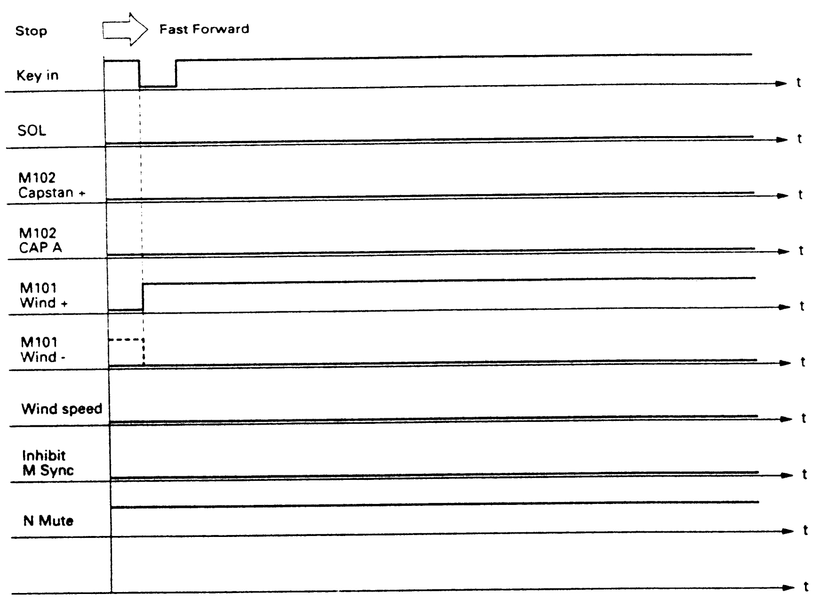


TAPE DECK TIMING CHART 2

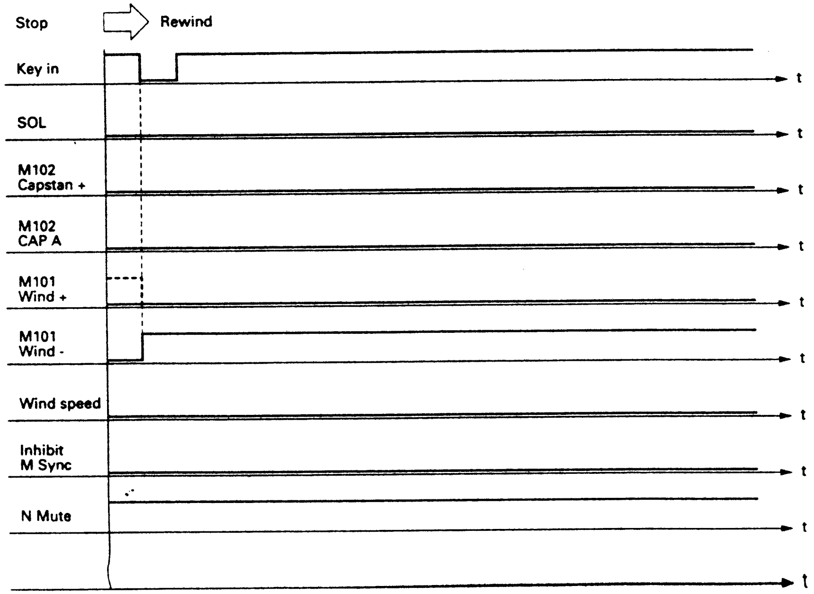


● This timing is the data when mold flywheels are used.
Please change to more than 150 mS at Zn-diecasting or sinterd flywheels.

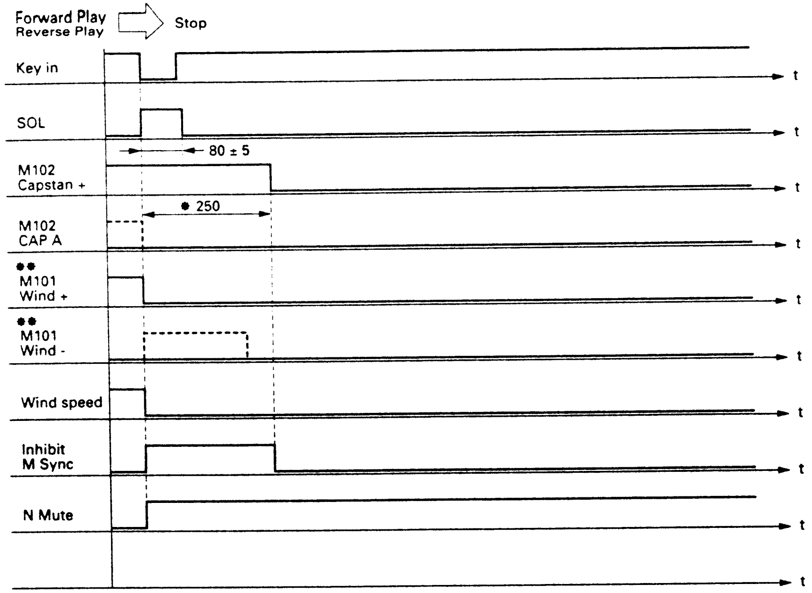
TAPE DECK TIMING CHART 3


Stop
Fast Forward
Key in
SOL
M102 Capstan +
M102 CAP A
M101 Wind +
M101 Wind -
Wind speed
Inhibit M Sync
N Mute
t

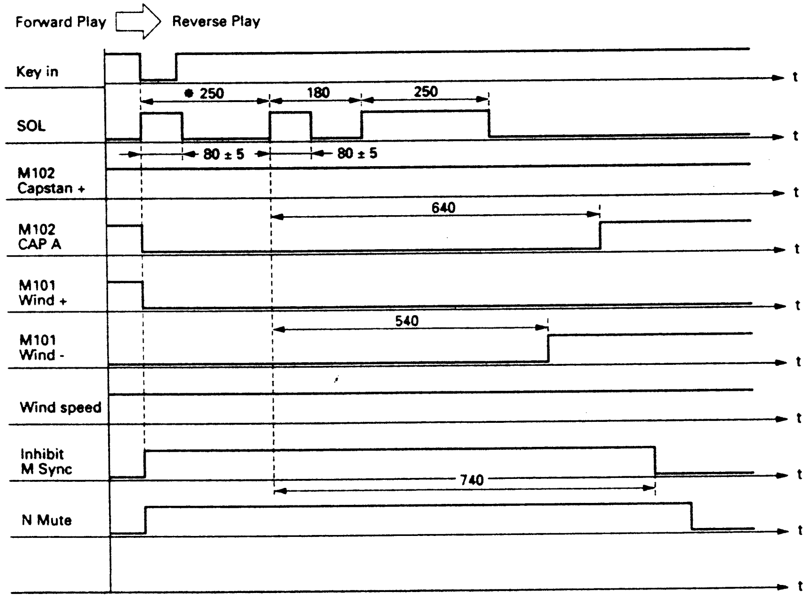
TAPE DECK TIMING CHART 4


Stop
Rewind
Key in
SOL
M102 Capstan +
M102 CAP A
M101 Wind +
M101 Wind -
Wind speed
Inhibit M Sync
N Mute
t

TAPE DECK TIMING CHART 5


Forward Play
Reverse Play
Stop
Key in
SOL
80 ± 5
M102 Capstan +
● 250
M102 CAP A
●● M101 Wind +
●● M101 Wind -
Wind speed
Inhibit M Sync
N Mute
t

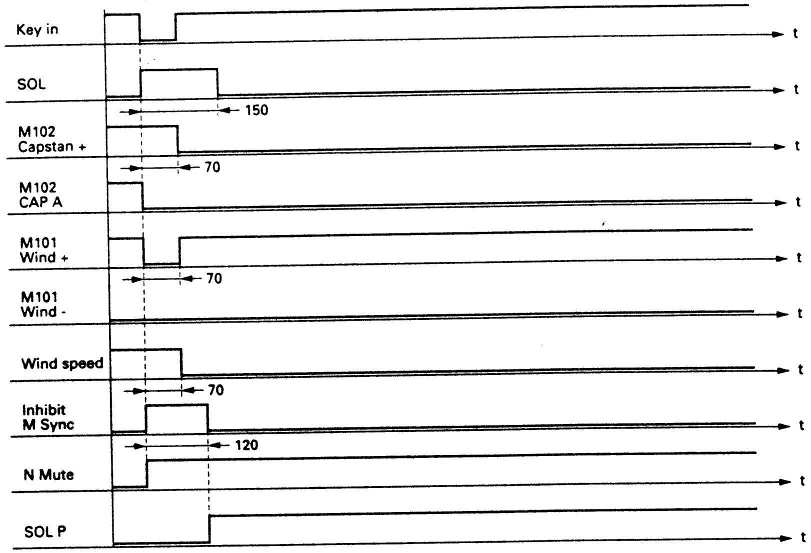
TAPE DECK TIMING CHART 6


Forward Play
Reverse Play
Key in
● 250
180
250
SOL
80 ± 5
80 ± 5
M102 Capstan +
640
M102 CAP A
M101 Wind +
540
M101 Wind -
Wind speed
Inhibit M Sync
740
N Mute
t

● Please change 250mS to 400mS at double speed PLAY mode.
●● Interchange M101 Wind + and M101 Wind - timing at REVERSE PLAY mode.

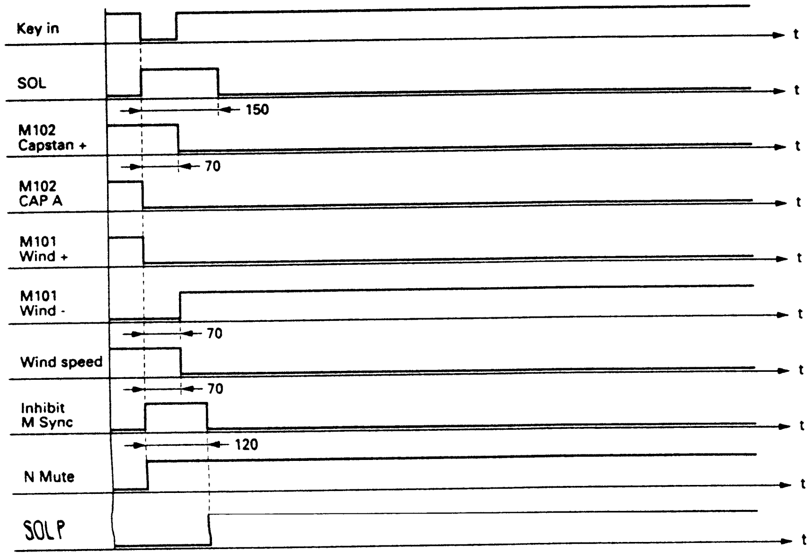
TAPE DECK TIMING CHART 7

Forward Play ⇨ "A"Head Fast Forward-Search


Key in
SOL
150
M102 Capstan +
70
M102 CAP A
M101 Wind +
70
M101 Wind -
Wind speed
70
Inhibit M Sync
120
N Mute
SOL P
t

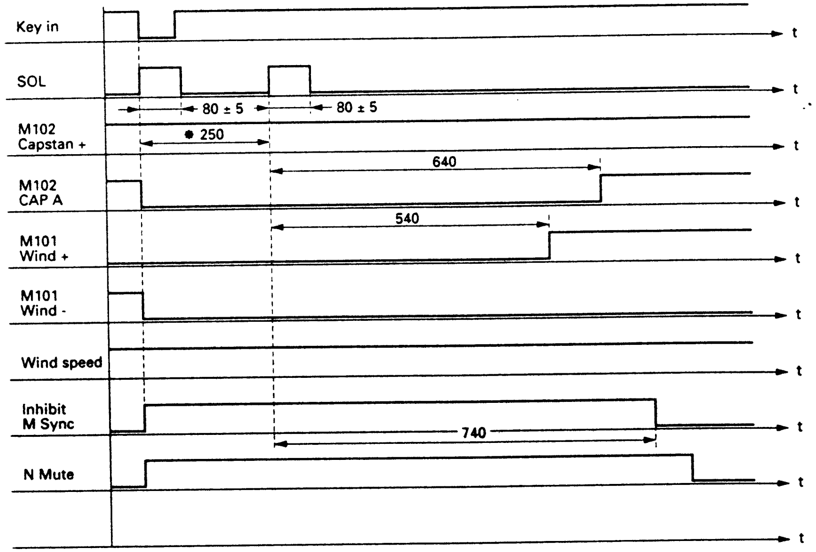
TAPE DECK TIMING CHART 8

Forward Play ⇨ "A"Head Rewind-Search


Key in
SOL
150
M102 Capstan +
70
M102 CAP A
M101 Wind +
M101 Wind -
70
Wind speed
70
Inhibit M Sync
120
N Mute
SOL P
t

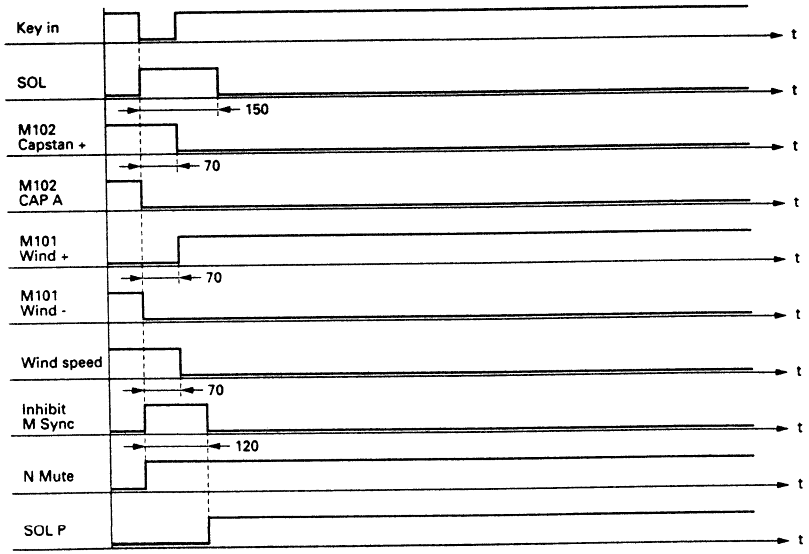
TAPE DECK TIMING CHART 9

Reverse Play ⇨ Forward Play


Key in
SOL
80 ± 5
80 ± 5
M102 Capstan +
● 250
640
M102 CAP A
540
M101 Wind +
M101 Wind -
Wind speed
Inhibit M Sync
740
N Mute
t

TAPE DECK TIMING CHART 10

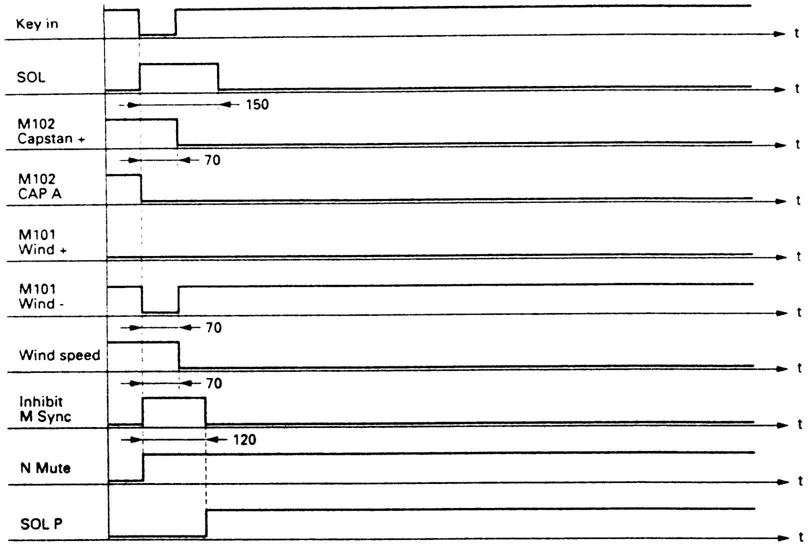
Reverse Play ⇨ "B" Head Fast Forward-Search


Key in
SOL
150
M102 Capstan +
70
M102 CAP A
M101 Wind +
70
M101 Wind -
Wind speed
70
Inhibit M Sync
120
N Mute
SOL P
t

● Please change 250mS to 400mS at double speed PLAY mode.

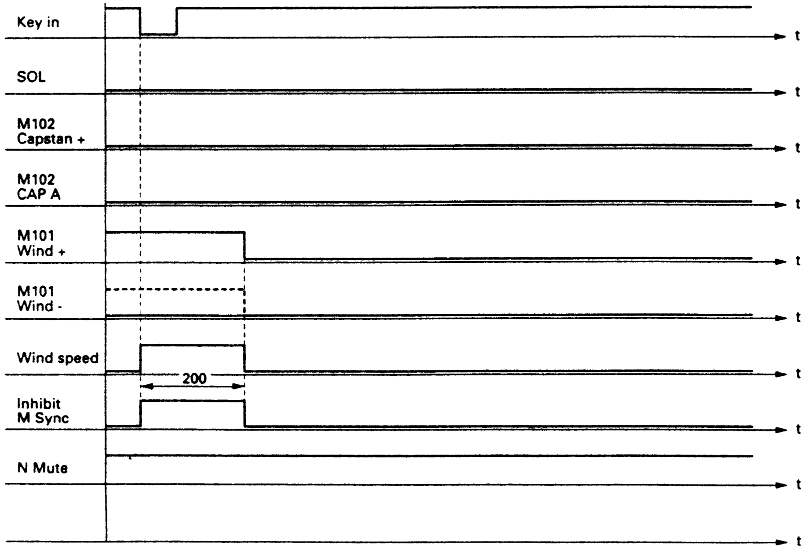
TAPE DECK TIMING CHART 11

Reverse Play ⇨ "B" Head Rewind-Search


Key in
t
SOL
150
M102 Capstan +
70
M102 CAP A
M101 Wind +
M101 Wind -
70
Wind speed
70
Inhibit M Sync
120
N Mute
SOL P

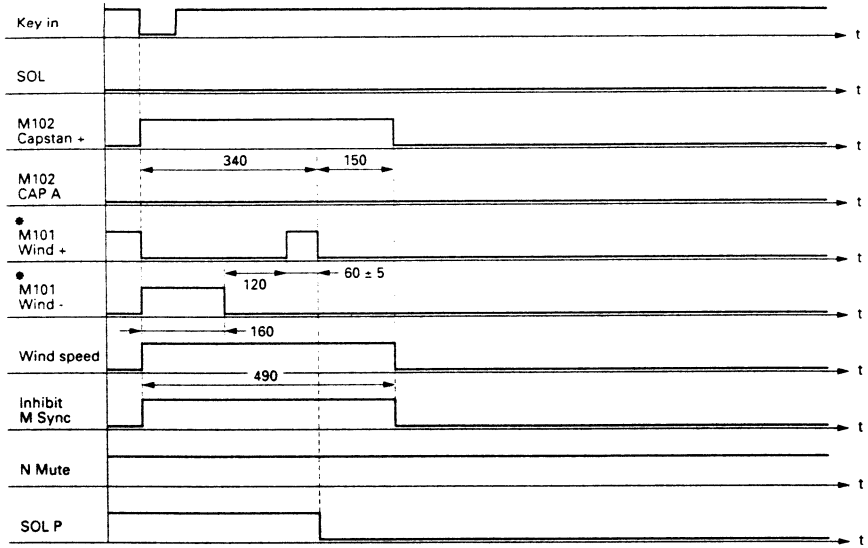
TAPE DECK TIMING CHART 12

Fast Forward (Rew.) ⇨ Stop


Key in
t
SOL
M102 Capstan +
M102 CAP A
M101 Wind +
M101 Wind -
Wind speed
200
Inhibit M Sync
N Mute

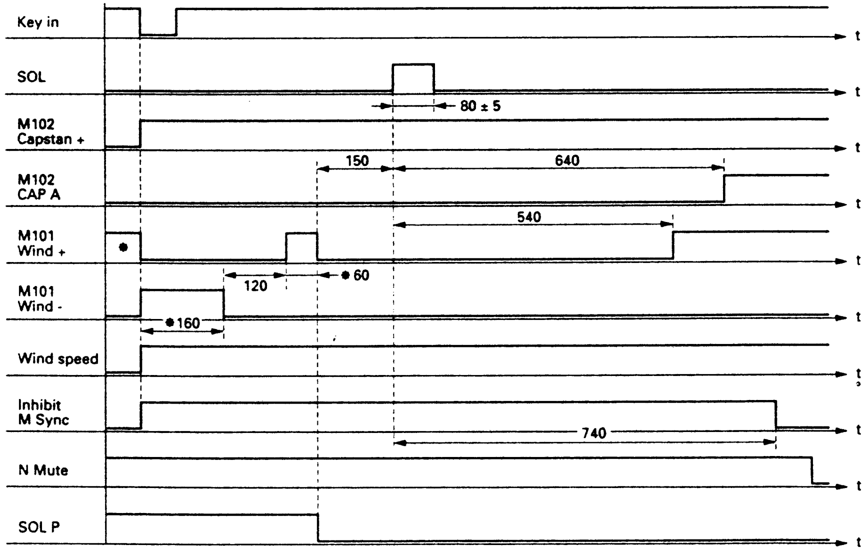
TAPE DECK TIMING CHART 13

Fast Forward-Search (Rew.) ⇨ Stop


Key in
t
SOL
M102 Capstan +
340
150
M102 CAP A
● M101 Wind +
120
60 ± 5
● M101 Wind -
160
Wind speed
490
Inhibit M Sync
N Mute
SOL P

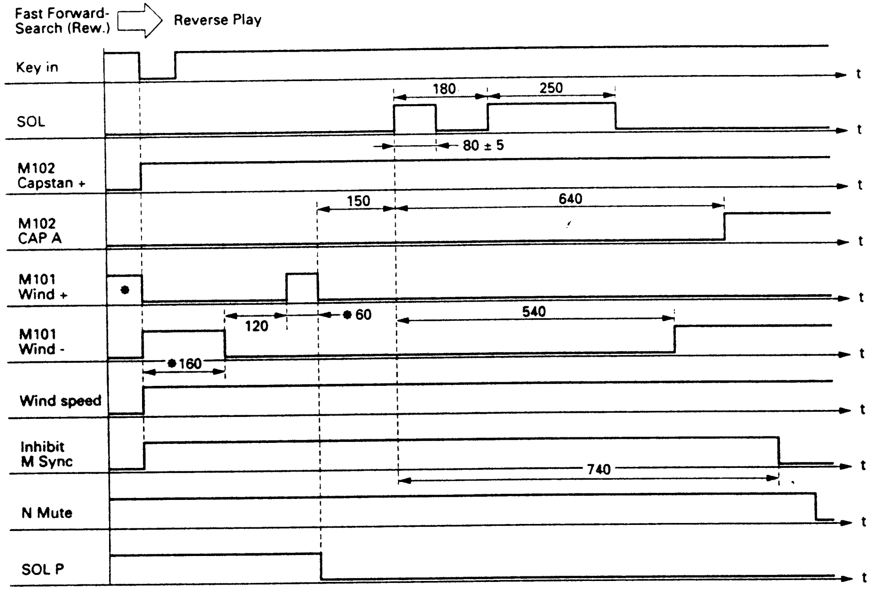
TAPE DECK TIMING CHART 14

Fast Forward-Search (Rew.) ⇨ Forward Play (Rec)

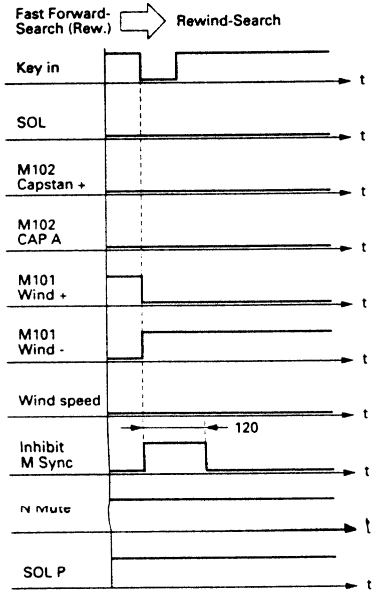

Key in
t
SOL
80 ± 5
M102 Capstan +
150
640
M102 CAP A
540
M101 Wind +
●
120
● 60
M101 Wind -
● 160
Wind speed
Inhibit M Sync
740
N Mute
SOL P

● Interchange M101 Wind + and M101 Wind - timing at Rewind-Search mode.

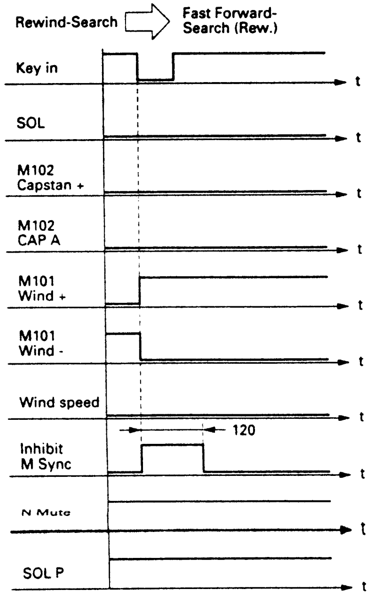
TAPE DECK TIMING CHART 15



TAPE DECK TIMING CHART 16



TAPE DECK TIMING CHART 17



● Interchange M101 Wind + and M101 Wind - timing at Rewind-Search mode.

SBP0187

MECHANICAL PARTSLIST FLAP LOADER

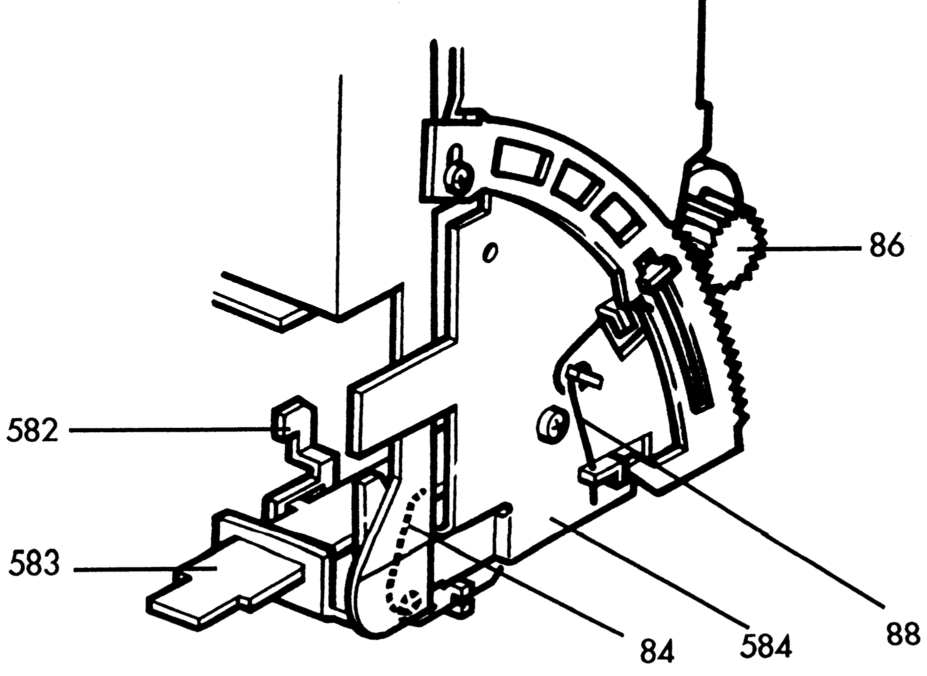
MECHANICAL PARTS

86	4822 529 10318	DAMPER
82	4822 443 64484	FLAP ASSY
81	4822 466 93487	PLATE COVER
88	4822 492 52425	FLAP EJECT SPRING
84	4822 492 52424	EJECT BUTTON SPRING

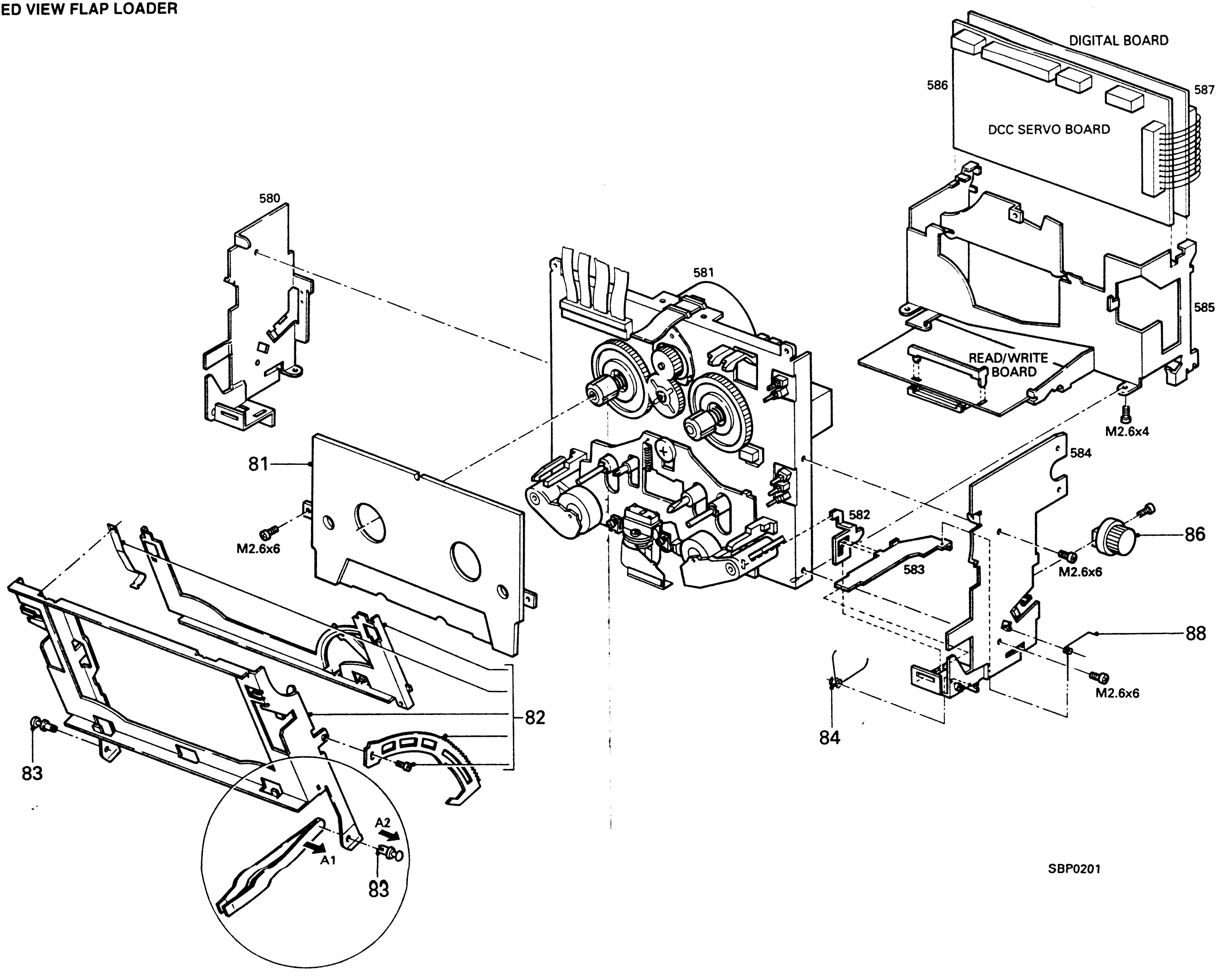
TOOLS

4822 395 50452	HEAD ALIGN SRWDRVR
4822 395 80411	HEAD ADJUSTING JIG
4822 397 30071	ACC TESTCASSETTE
4822 395 30288	MIRROR CASSETTE
4822 397 30264	9.6KHZ CAL. DCC CASSETTE
4822 397 30271	DOLBY TEAC TESTCASSETTE
4822 015 20646	DCC CLEANING CASSETTE

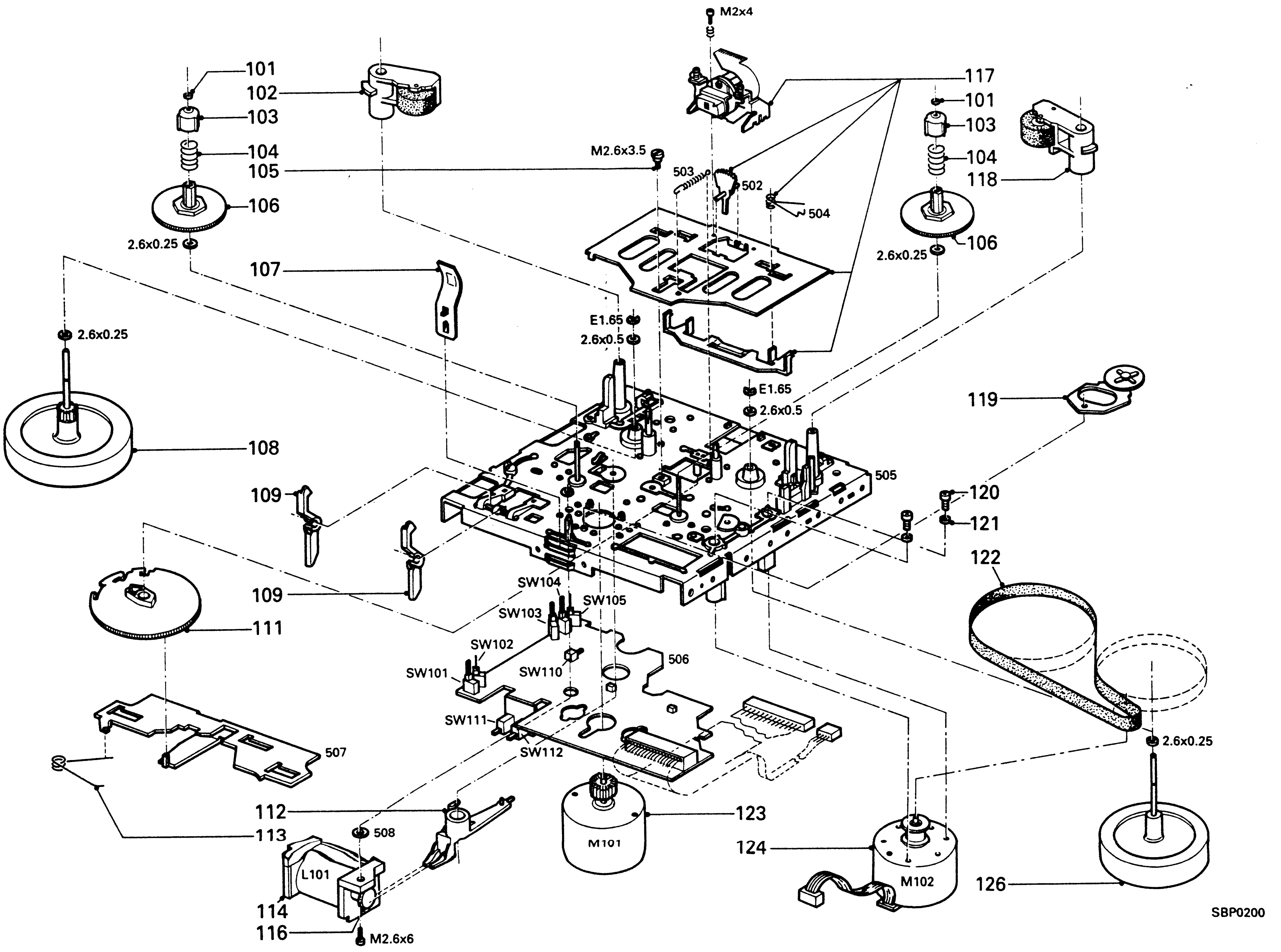
ASSEMBLING EJECT LEVER



EXPLODED VIEW FLAP LOADER


DIGITAL BOARD
586
587
DCC SERVO BOARD
580
581
585
READ/WRITE BOARD
M2.6x4
584
81
M2.6x6
582
583
86
M2.6x6
88
M2.6x6
84
82
83
A2
A1
83
SBP0201

EXPLODED VIEW DCC DECK


M2x4
101
102
103
104
105
106
2.6x0.25
117
101
103
104
118
106
2.6x0.25
M2.6x3.5
503
502
504
107
E1.65
2.6x0.5
E1.65
2.6x0.5
2.6x0.25
108
119
505
120
121
109
109
122
111
SW104
SW105
SW103
SW102
SW101
SW110
506
SW111
SW112
507
2.6x0.25
112
508
113
123
M101
124
M102
126
L101
114
116
M2.6x6
SBP0200

PARTLIST DCC DECK

MECHANICAL PARTS

101	4822 532 52211	WASHER 1.7x0.25 PS
102	4822 403 40525	PINCH ROLLER ASSY RIGHT
103	4822 522 33501	REEL HUBS CAP
104	4822 492 52412	REEL HUBS SPRING
105	4822 502 21547	M2.6x3.5 SCR HEAD-SUPPORT
106	4822 522 20458	REEL HUB TOOTH WHEEL
107	4822 492 71477	CASSETTE LEAF SPRING
108	4822 528 60419	CAPSTAN WHEEL RIGHT
109	4822 403 71102	PACK LEVER CASS. SW
111	4822 522 33449	COMM.WHEEL CAM GEAR
112	4822 403 71103	COMMAND PLAY ARM
113	4822 492 42699	TORS SPRING COM.PLAT
116	4822 526 10607	PLANGER SOL. CORE
117	4822 520 10769	HEAD-SUPPORT ASSY
	4822 502 12955	M2x4 ON HEAD-SUPPORT
	4822 502 13235	M1.4x4 ON HEAD-SUPPORT
118	4822 403 40524	PINCH ROLLER ASSY LEFT
119	4822 358 20456	IDLER WHEEL WINDMOTOR
122	4822 358 31341	MAIN BELT DDU2212
123	4822 361 21701	MOTOR REEL MSN5F095A
124	4822 361 21768	MOTOR MAIN BLK
126	4822 528 60421	CAPSTAN WHEEL LEFT
2.6x6	4822 502 12453	M2.6x6 TAPTITE SCREW
2.6x6	4822 502 12111	M2.6x6 MACH SCR M101
M3x4	4822 502 13406	M3x4 MACH SCR M81
2.1x0.25	4822 532 52475	2.1x0.25 WASHER
1.7x0.25	4822 530 70616	1.7x0.25 WASHER LOCK
2.6x0.25	4822 530 80532	2.6x0.25 WASHER
2.6x0.5	4822 532 11705	2.6x0.5 WASHER
E-165	4822 530 70121	E-CLIP E1.65
501	4822 249 10501	DCC HEAD DDU MODULE
505	4822 464 51096	CHASSIS
506	4822 214 52175	PCB TAPE DECK ASSY
507	4822 403 71099	COMMAND SLIDE PLATE

TOOLS

4822 395 50452	HEAD ALIGN SCREWDRIVER
4822 395 80411	HEAD ADJUSTING JIG
4822 397 30071	ACC TESTCASSETTE
4822 395 30288	MIRROR CASSETTE
4822 397 30264	9.6kHz CAL. DCC CASSETTE
4822 397 30271	DOLBY TEAC TESTCASSETTE
4822 015 20646	DCC CLEANING CASSETTE

ELECTRICAL PARTSLIST DCC TAPE DRIVE BOARD

MISCELLANEOUS

1003	4822 214 52195	TAPE DRIVE PCB ASSY

DIODES

6550	4822 130 81755	BZX84-B4V3
6560	5322 130 31928	BAS16
6561	5322 130 31928	BAS16
6570	4822 130 32911	BYV10-30
6571	4822 130 83665	BZX84-B16

TRANSISTORS

7520	5322 130 42136	BC848C(CHIP)
7522	5322 130 42136	BC848C(CHIP)
7523	5322 130 42136	BC848C(CHIP)
7524	5322 130 42012	BC858 (CHIP)
7540	5322 130 42136	BC848C(CHIP)
7541	5322 130 42136	BC848C(CHIP)
7542	4822 130 42655	BC808-40 (CHIP)
7551	5322 130 42136	BC848C(CHIP)
7552	5322 130 42012	BC858 (CHIP)
7560	5322 130 42136	BC848C(CHIP)
7561	5322 130 42136	BC848C(CHIP)
7562	4822 130 41344	BC337-40
7563	5322 130 42136	BC848C(CHIP)
7564	4822 130 42616	BC818-40 (UAW)
7580	4822 209 33391	BA6246N

INTEGRATED CIRCUITS

7500	4822 209 33915	P87C52EBPN-CV5454-1N
7505	4822 209 31615	LM324A
7510	4822 209 70672	LM358N
7570	4822 209 60059	MC34063A
7581	5322 209 61482	PC74HC4066T

COILS

1500	4822 242 81738	CER. RES. 11.0MHz
5570	4822 157 71152	150µH

RESISTORS

3501	4822 052 10478	4R7	5%	NFR
3526	4822 052 10229	22R	5%	0,33W
3555	4822 052 10229	22R	5%	0,33W
3565	4822 050 22709	27R	1%	0,6W
3566	4822 050 22709	27R	1%	0,6W

CHIP RESISTORS

3500	4822 051 20105	1M	5%	0,1W
3502	4822 117 11158	62k	5%	0,1W
3503	4822 051 10102	1k	2%	0,25W
3504	4822 117 11158	62k	5%	0,1W
3506	4822 117 10833	10k	1%	0,1W
3507	4822 117 10833	10k	1%	0,1W
3508	4822 051 20224	220k	5%	0,1W
3509	4822 051 10102	1k	2%	0,25W
3513	4822 051 20224	220k	5%	0,1W
3525	4822 051 20333	33k	5%	0,1W
3527	4822 051 20104	100k	5%	0,1W
3528	4822 117 11149	82k	1%	0,1W
3530	4822 051 20472	4k7	5%	0,1W
3531	4822 117 10833	10k	1%	0,1W
3532	4822 117 11139	1k5	5%	0,1W

CHIP RESISTORS

3533	4822 051 20122	1,2k	5%	0,1W
3534	4822 051 10102	1k	2%	0,25W
3535	4822 051 20472	4k7	5%	0,1W
3536	4822 117 10834	47k	1%	0,1W
3537	4822 051 20133	13k	5%	0,1W
3538	4822 051 20133	13k	5%	0,1W
3539	4822 051 20472	4k7	5%	0,1W
3540	4822 051 20472	4k7	5%	0,1W
3541	4822 117 10834	47k	1%	0,1W
3542	5322 100 11542	POTMETER 4k7 LIN		
3543	5322 100 11542	POTMETER 4k7 LIN		
3544	4822 051 20822	8k2	5%	0,1W
3545	4822 051 20472	4k7	5%	0,1W
3546	4822 117 10833	10k	1%	0,1W
3547	4822 116 83933	15k	1%	0,1W
3548	4822 117 11384	2k7	1%	0,1W
3550	4822 051 20331	330R	5%	0,1W
3551	4822 051 10102	1k	2%	0,25W
3552	4822 117 11383	12k	1%	0,1W
3553	4822 117 11148	56k	1%	0,1W
3554	4822 051 20221	220R	5%	0,1W
3556	4822 051 20471	470R	5%	0,1W
3557	4822 051 10102	1k	2%	0,25W
3558	4822 051 20153	15k	5%	0,1W
3560	4822 051 20472	4k7	5%	0,1W
3561	4822 117 10833	10k	1%	0,1W
3562	4822 051 20331	330R	5%	0,1W
3563	4822 051 10102	1k	2%	0,25W
3564	4822 051 20271	270R	5%	0,1W
3567	4822 051 20472	4k7	5%	0,1W
3568	4822 117 10833	10k	1%	0,1W
3569	4822 051 20331	330R	5%	0,1W
3570	4822 117 11152	4R7	5%	0,06W
3571	4822 117 11151	1R	5%	0,06W
3572	4822 117 11151	1R	5%	0,06W
3573	4822 051 20181	180R	5%	0,1W
3574	4822 051 10102	1k	2%	0,25W
3580	4822 116 30468	220R	5%	0,2W
3581	4822 116 30468	220R	5%	0,2W

CAPACITORS

2503	4822 124 40433	47µF	20%	25V
2522	4822 124 40433	47µF	20%	25V
2525	4822 124 40243	1,5µF	20%	63V
2570	4822 124 40433	47µF	20%	25V
2573	4822 124 40433	47µF	20%	25V
2575	4822 124 40433	47µF	20%	25V

CHIP CAPACITORS

2500	4822 122 33809	22nF	20%	50V
2504	5322 122 32531	100pF	5%	50V
2521	4822 122 33809	22nF	20%	50V
2545	4822 126 13189	1µF	20%	16V
2550	4822 122 33809	22nF	20%	50V
2571	4822 122 33809	22nF	20%	50V
2572	4822 122 33216	270pF	5%	50V
2574	4822 122 33809	22nF	20%	50V
2576	4822 122 33809	22nF	20%	50V
2580	4822 122 33809	22nF	20%	50V
2581	4822 122 33809	22nF	20%	50V
2599	4822 122 33496	100nF	10%	63V

ELECTRICAL PARTSLIST DCC READ/WRITE BOARD

MISCELLANEOUS

1001	4822 214 52193	READ/WRITE PCB ASSY

DIODES

6800	5322 130 31928	BAS16

TRANSISTORS

7800	4822 130 42675	BC818
7801	5322 130 41982	BC848 (CHIP)
7802	4822 130 42675	BC818
7803	5322 130 41982	BC848 (CHIP)
7804	5322 130 41982	BC848 (CHIP)
7830	5322 130 41982	BC848 (CHIP)
7835	5322 130 41982	BC848 (CHIP)
7861	5322 130 41982	BC848 (CHIP)
7871	5322 130 41982	BC848 (CHIP)
7883	4822 130 42615	BC817-40(CHIP)
7910	5322 130 41982	BC848 (CHIP)
7911	5322 130 41979	BC808 (CHIP)
7912	5322 130 41982	BC848 (CHIP)

INTEGRATED CIRCUITS

7805	4822 209 31995	TDA1317H
7860	4822 209 33392	MC34074AD
7882	4822 209 33396	TDA1319T/N1
7900	4822 209 33411	MC78L05ACD

COILS

5835	4822 157 70298	15µH
5836	4822 157 70298	15µH
5837	4822 157 70298	15µH
5860	4822 157 63622	470nH

CHIP RESISTORS

3000	4822 051 30223	22k	5%	0,06W
3800	4822 051 30561	560R	5%	0,06W
3801	4822 051 30561	560R	5%	0,06W
3802	4822 051 30561	560R	5%	0,06W
3803	4822 051 30561	560R	5%	0,06W
3804	4822 051 30561	560R	5%	0,06W
3805	4822 051 30561	560R	5%	0,06W
3806	4822 051 30561	560R	5%	0,06W
3807	4822 051 30561	560R	5%	0,06W
3808	4822 051 30561	560R	5%	0,06W
3809	4822 051 30681	680R	5%	0,06W
3810	4822 051 30222	2k2	5%	0,06W
3811	4822 051 30473	47k	5%	0,06W
3812	4822 051 30104	100k	5%	0,06W
3813	4822 051 30103	10k	5%	0,06W
3814	4822 051 30104	100k	5%	0,06W
3815	4822 051 30472	4k7	5%	0,06W
3816	4822 051 30562	5k6	5%	0,06W
3817	4822 051 30393	39k	5%	0,06W
3818	4822 051 30479	47R	5%	0,06W
3819	4822 051 30104	100k	5%	0,06W
3830	4822 051 30103	10k	5%	0,06W
3831	4822 051 30103	10k	5%	0,06W
3832	4822 051 30103	10k	5%	0,06W
3833	4822 051 30103	10k	5%	0,06W

CHIP RESISTORS

3835	4822 051 30229	22R	5%	0,06W
3836	4822 051 30229	22R	5%	0,06W
3837	4822 051 30279	27R	5%	0,06W
3838	4822 051 30101	100R	5%	0,06W
3839	4822 051 30152	1k5	5%	0,06W
3840	4822 051 30561	560R	5%	0,06W
3841	4822 051 30182	1k8	5%	0,06W
3842	4822 051 30331	330R	5%	0,06W
3843	4822 051 30331	330R	5%	0,06W
3844	4822 051 30109	10R	5%	0,06W
3845	4822 051 30109	10R	5%	0,06W
3846	4822 051 30109	10R	5%	0,06W
3847	4822 051 30109	10R	5%	0,06W
3848	4822 051 30152	1k5	5%	0,06W
3849	4822 051 30152	1k5	5%	0,06W
3850	4822 051 30274	270k	5%	0,06W
3851	4822 051 30333	33k	5%	0,06W
3852	4822 051 30102	1k	5%	0,06W
3853	4822 051 30183	18k	5%	0,06W
3854	4822 051 30333	33k	5%	0,06W
3855	4822 051 30102	1k	5%	0,06W
3856	4822 051 30183	18k	5%	0,06W
3857	4822 051 30274	270k	5%	0,06W
3858	4822 051 30152	1k5	5%	0,06W
3859	4822 051 30152	1k5	5%	0,06W
3860	4822 116 83933	15k	1%	0,1W
3861	4822 051 30473	47k	5%	0,06W
3862	4822 117 11154	1k	1%	0,1W
3863	4822 117 10356	39k	1%	0,1W
3864	4822 117 11137	68k	1%	0,1W
3865	4822 117 11147	270k	1%	0,1W
3866	4822 117 11148	56k	1%	0,1W
3868	4822 117 10965	18k	2%	0,1W
3869	4822 117 11149	82k	1%	0,1W
3870	4822 116 83933	15k	1%	0,1W
3871	4822 051 30473	47k	5%	0,06W
3872	4822 117 11154	1k	1%	0,1W
3873	4822 117 10356	39k	1%	0,1W
3874	4822 117 11137	68k	1%	0,1W
3875	4822 117 11147	270k	1%	0,1W
3876	4822 117 11148	56k	1%	0,1W
3878	4822 117 10965	18k	2%	0,1W
3879	4822 117 11149	82k	1%	0,1W
3880	4822 051 30222	2k2	5%	0,06W
3881	4822 051 30399	39R	5%	0,06W
3882	4822 051 30399	39R	5%	0,06W
3883	4822 051 30399	39R	5%	0,06W
3884	4822 051 30399	39R	5%	0,06W
3885	4822 051 30122	1k2	5%	0,06W
3886	4822 051 30159	15R	5%	0,06W
3887	4822 051 20228	2R	25%	0,1W
3888	4822 101 11318	POTMETER 22k LIN		
3889	4822 051 30103	10k	5%	0,06W
3890	4822 051 30473	47k	5%	0,06W
3891	4822 051 30221	220R	5%	0,06W
3892	4822 051 30683	68k	5%	0,06W
3893	4822 051 30822	8k2	5%	0,06W
3894	4822 051 30333	33k	5%	0,06W
3895	4822 051 30562	5k6	5%	0,06W
3896	4822 051 30104	100k	5%	0,06W

ELECTRICAL PARTSLIST DCC READ/WRITE BOARD

CHIP RESISTORS

3897	4822 051 30229	22R	5%	0,06W
3898	4822 051 30229	22R	5%	0,06W
3899	4822 051 30229	22R	5%	0,06W
3900	4822 051 30229	22R	5%	0,06W
3901	4822 051 30229	22R	5%	0,06W
3902	4822 051 30229	22R	5%	0,06W
3903	4822 051 30229	22R	5%	0,06W
3904	4822 051 30229	22R	5%	0,06W
3905	4822 051 30229	22R	5%	0,06W
3906	4822 051 30472	4k7	5%	0,06W
3907	4822 051 30271	270R	5%	0,06W
3908	4822 051 30561	560R	5%	0,06W
3909	4822 051 30561	560R	5%	0,06W
3910	4822 051 30688	6R8	5%	0,06W
3911	4822 051 30222	2k2	5%	0,06W
3912	4822 051 30392	3k9	5%	0,06W
3913	4822 051 30102	1k	5%	0,06W
3914	4822 051 30821	820R	5%	0,06W
3915	4822 051 30688	6R8	5%	0,06W

CHIP CAPACITORS

2800	4822 126 13193	4,7nF	10%	63V
2801	5322 126 11583	10nF	10%	63V
2802	5322 126 11583	10nF	10%	63V
2803	5322 126 11583	10nF	10%	63V
2804	5322 126 11583	10nF	10%	63V
2805	5322 126 11583	10nF	10%	63V
2806	5322 126 11583	10nF	10%	63V
2807	5322 126 11583	10nF	10%	63V
2808	5322 126 11583	10nF	10%	63V
2809	4822 126 13189	1µF	20%	16V
2810	4822 126 13189	1µF	20%	16V
2811	4822 126 13189	1µF	20%	16V
2812	4822 126 13189	1µF	20%	16V
2813	4822 126 13189	1µF	20%	16V
2814	4822 126 13189	1µF	20%	16V
2815	4822 126 13189	1µF	20%	16V
2816	4822 126 13189	1µF	20%	16V
2817	4822 126 13189	1µF	20%	16V
2818	4822 126 13189	1µF	20%	16V
2819	4822 124 80867	10µF	20%	16V
2820	5322 126 11583	10nF	10%	63V
2821	5322 126 11583	10nF	10%	63V
2822	4822 126 13196	100nF	10%	25V
2823	4822 126 13196	100nF	10%	25V
2824	4822 124 80867	10µF	20%	16V
2825	4822 124 80867	10µF	20%	16V
2826	4822 124 80867	10µF	20%	16V
2827	4822 124 80867	10µF	20%	16V
2828	5322 126 11583	10nF	10%	63V
2829	5322 126 11583	10nF	10%	63V
2830	5322 126 11583	10nF	10%	63V
2835	5322 126 11578	1nF	10%	63V
2836	4822 126 13192	2,2nF	10%	63V
2837	4822 126 13192	2,2nF	10%	63V
2838	4822 126 13196	100nF	10%	25V
2839	4822 122 33775	39pF	5%	50V
2840	4822 126 13196	100nF	10%	25V
2841	4822 126 13196	100nF	10%	25V

CHIP CAPACITORS

2842	4822 124 80867	10µF	20%	16V
2843	4822 124 80867	10µF	20%	16V
2844	4822 126 13191	470pF	10%	63V
2845	4822 126 13191	470pF	10%	63V
2846	4822 126 13189	1µF	20%	16V
2847	5322 126 11583	10nF	10%	63V
2860	4822 126 13189	1µF	20%	16V
2861	4822 122 32627	2,2nF	10%	50V
2862	4822 122 32627	2,2nF	10%	50V
2863	4822 126 10525	8,2nF	10%	63V
2864	4822 126 10525	8,2nF	10%	63V
2865	4822 122 33761	22pF	5%	50V
2866	4822 122 33761	22pF	5%	50V
2870	4822 122 32627	2,2nF	10%	50V
2871	4822 122 32627	2,2nF	10%	50V
2872	4822 126 10525	8,2nF	10%	63V
2873	4822 126 10525	8,2nF	10%	63V
2874	4822 126 13189	1µF	20%	16V
2880	4822 124 80867	10µF	20%	16V
2881	4822 126 13196	100nF	10%	25V
2882	4822 126 13196	100nF	10%	25V
2883	4822 124 80867	10µF	20%	16V
2884	5322 126 11579	3,3nF	10%	63V
2885	5322 126 11579	3,3nF	10%	63V
2886	5322 126 11579	3,3nF	10%	63V
2887	5322 126 11579	3,3nF	10%	63V
2888	5322 126 11579	3,3nF	10%	63V
2889	5322 126 11579	3,3nF	10%	63V
2890	5322 126 11579	3,3nF	10%	63V
2891	5322 126 11579	3,3nF	10%	63V
2892	5322 126 11579	3,3nF	10%	63V
2910	4822 124 80867	10µF	20%	16V
2911	5322 126 11583	10nF	10%	63V
2912	4822 126 13196	100nF	10%	25V
2914	4822 124 80867	10µF	20%	16V
2999	4822 126 13196	100nF	10%	25V

ELECTRICAL PARTSLIST DCC DIGITAL BOARD

MISCELLANEOUS

1002	4822 214 52194	DIGITAL PCB ASSY

DIODES

6600	5322 130 31928	BAS16
6630	4822 130 80654	BZX84-B3V9
6631	5322 130 31928	BAS16
6632	4822 130 80654	BZX84-B3V9

TRANSISTORS

7632	4822 130 61207	BC848 (CHIP)
7633	4822 130 61207	BC848 (CHIP)

INTEGRATED CIRCUITS

7600	4822 209 33401	SAA2013H
7610	4822 209 33399	SAA2003H
7630	4822 209 33402	SAA2023GP
7631	4822 209 33387	MN41C4256ASJ-08-
7700	4822 209 33388	UPD78P056GC-
7701	4822 209 30739	MC74HC04AD
7702	4822 209 33389	MC74HC32AD
7730	4822 209 60792	74HC4053D
7760	4822 209 33403	TDA1305T/N2
7780	4822 209 33397	SAA7366T

COILS

1610	4822 242 81359	X-TAL 22,579MHz
1611	4822 242 81358	X-TAL 24,576MHz
1700	4822 242 81739	CER. RES. 4,91MHz
3601	4822 157 71267	IND 100MHZ 600R
3615	4822 157 71267	IND 100MHZ 600R
3635	4822 157 71267	IND 100MHZ 600R
3636	4822 157 71267	IND 100MHZ 600R
3705	4822 157 71267	IND 100MHZ 600R
3706	4822 157 71267	IND 100MHZ 600R
3761	4822 157 71267	IND 100MHZ 600R
3762	4822 157 71267	IND 100MHZ 600R
3787	4822 157 71267	IND 100MHZ 600R
5600	4822 157 71267	IND 100MHZ 600R
5601	4822 157 71267	IND 100MHZ 600R
5602	4822 157 71267	IND 100MHZ 600R
5603	4822 157 71267	IND 100MHZ 600R
5630	4822 157 70298	15µH
5700	4822 157 71267	IND 100MHZ 600R
5701	4822 157 71267	IND 100MHZ 600R
5702	4822 157 71267	IND 100MHZ 600R

CHIP RESISTORS

3600	4822 051 20333	33k	5%	0,1W
3610	4822 051 20105	1M	5%	0,1W
3611	4822 051 10102	1k	2%	0,25W
3612	4822 051 20105	1M	5%	0,1W
3613	4822 051 10102	1k	2%	0,25W
3619	4822 051 20479	47R	5%	0,1W
3630	4822 051 20121	120R	5%	0,1W
3631	4822 051 20221	220R	5%	0,1W
3632	4822 117 10834	47k	1%	0,1W
3633	4822 117 10833	10k	1%	0,1W
3634	4822 051 20472	4k7	5%	0,1W
3637	4822 051 20471	470R	5%	0,1W

CHIP RESISTORS

3638	4822 051 20471	470R	5%	0,1W
3639	4822 051 20331	330R	5%	0,1W
3640	4822 051 20331	330R	5%	0,1W
3641	4822 051 20122	1,2k	5%	0,1W
3642	4822 051 20471	470R	5%	0,1W
3700	4822 117 10833	10k	1%	0,1W
3701	4822 117 10833	10k	1%	0,1W
3702	4822 117 10833	10k	1%	0,1W
3703	4822 117 10833	10k	1%	0,1W
3704	4822 117 10833	10k	1%	0,1W
3707	4822 051 20105	1M	5%	0,1W
3708	4822 051 20472	4k7	5%	0,1W
3709	4822 117 10833	10k	1%	0,1W
3710	4822 117 10833	10k	1%	0,1W
3711	4822 117 10833	10k	1%	0,1W
3712	4822 117 10833	10k	1%	0,1W
3764	4822 117 10833	10k	1%	0,1W
3765	4822 051 10102	1k	2%	0,25W
3780	4822 051 20624	620k	5%	0,1W
3781	4822 051 20113	11k	5%	0,1W
3782	4822 051 20334	330k	5%	0,1W
3783	4822 051 20222	2k2	5%	0,1W
3784	4822 051 20222	2k2	5%	0,1W
3785	4822 051 20113	11k	5%	0,1W
3786	4822 051 20333	33k	5%	0,1W
3788	4822 051 20271	270R	5%	0,1W
3789	4822 051 20271	270R	5%	0,1W
3790	4822 051 20008	CHIP JUMPER 0805		
3791	4822 051 20008	CHIP JUMPER 0805		
4004	4822 051 20008	CHIP JUMPER 0805		

CAPACITORS

2762	4822 122 31746	1nF	5%	50V
2763	4822 122 31746	1nF	5%	50V

CHIP CAPACITORS

2600	4822 122 33496	100nF	10%	63V
2601	4822 122 33809	22nF	20%	50V
2602	4822 122 33809	22nF	20%	50V
2603	4822 122 33809	22nF	20%	50V
2605	4822 122 33809	22nF	20%	50V
2606	4822 122 33809	22nF	20%	50V
2607	4822 122 33809	22nF	20%	50V
2610	4822 122 33809	22nF	20%	50V
2611	4822 122 33809	22nF	20%	50V
2612	4822 122 33809	22nF	20%	50V
2613	5322 122 32481	15pF	5%	50V
2614	5322 122 31946	27pF	5%	50V
2615	5322 122 32481	15pF	5%	50V
2616	5322 122 31946	27pF	5%	50V
2617	5322 122 32448	10pF	5%	50V
2618	5322 122 32448	10pF	5%	50V
2630	4822 122 33809	22nF	20%	50V
2631	4822 122 33515	82pF	5%	50V
2632	4822 122 33496	100nF	10%	63V
2633	4822 122 33496	100nF	10%	63V
2634	5322 122 32531	100pF	5%	50V
2635	4822 122 33809	22nF	20%	50V
2636	4822 122 33809	22nF	20%	50V
2637	4822 122 33809	22nF	20%	50V

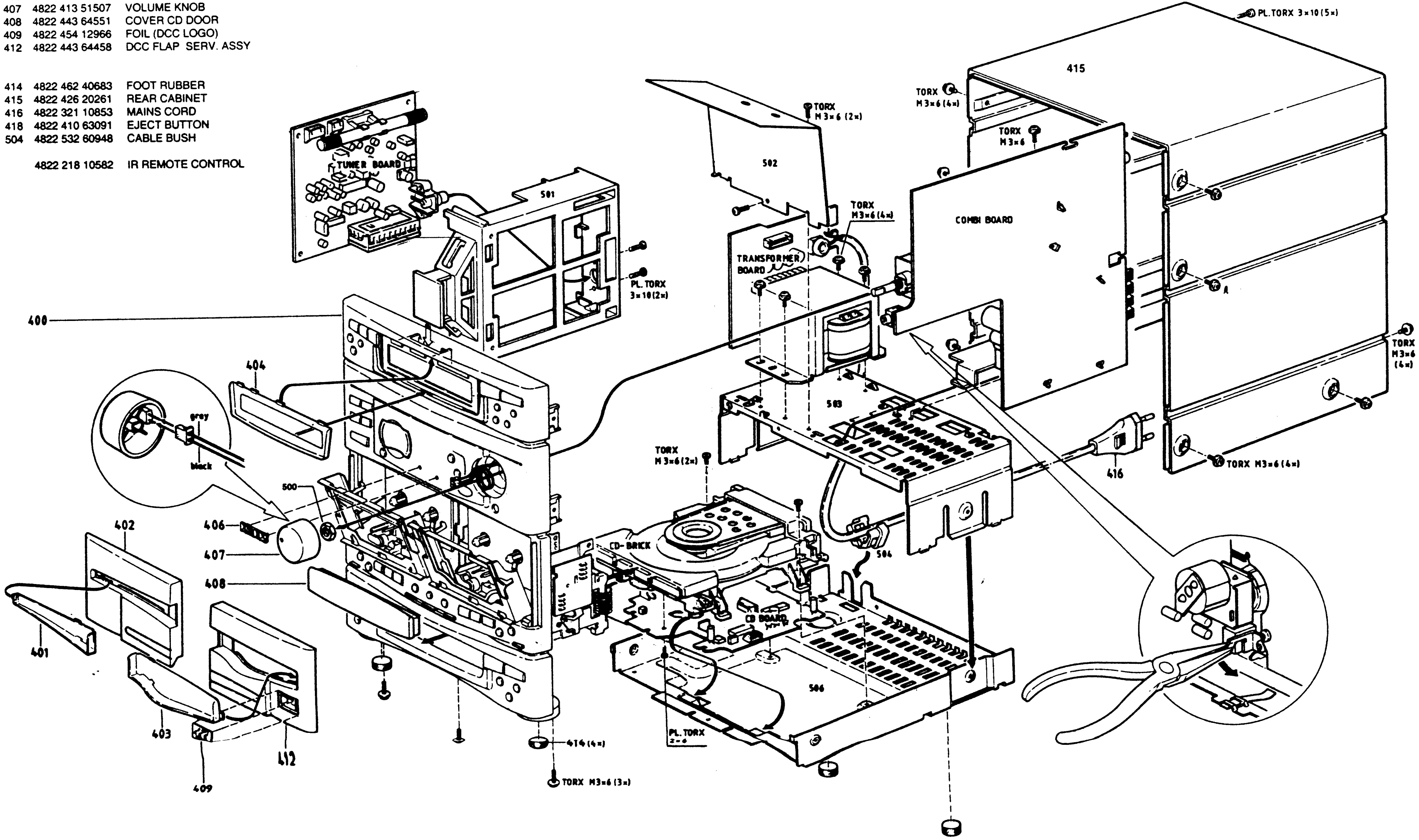
CHIP CAPACITORS

2638	4822 122 33809	22nF	20%	50V
2639	4822 122 33809	22nF	20%	50V
2640	4822 122 33809	22nF	20%	50V
2641	4822 122 33809	22nF	20%	50V
2642	4822 124 80866	47µF	20%	6,3V
2643	4822 122 32927	220nF	10%	63V
2644	4822 122 33809	22nF	20%	50V
2645	4822 122 33496	100nF	10%	63V
2700	5322 122 32531	100pF	5%	50V
2701	4822 122 33809	22nF	20%	50V
2702	4822 122 33809	22nF	20%	50V
2705	4822 122 33809	22nF	20%	50V
2706	4822 122 33809	22nF	20%	50V
2707	4822 122 33809	22nF	20%	50V
2760	4822 122 33809	22nF	20%	50V
2764	4822 124 80867	10µF	20%	16V
2766	4822 122 33809	22nF	20%	50V
2767	4822 124 80866	47µF	20%	6,3V
2768	4822 122 33809	22nF	20%	50V
2780	4822 124 80866	47µF	20%	6,3V
2781	4822 122 33809	22nF	20%	50V
2782	4822 122 33809	22nF	20%	50V
2783	4822 124 80866	47µF	20%	6,3V
2786	4822 122 33809	22nF	20%	50V
2787	4822 124 80866	47µF	20%	6,3V
2788	4822 122 33809	22nF	20%	50V
2790	4822 122 33809	22nF	20%	50V
2791	4822 124 80866	47µF	20%	6,3V
2792	4822 124 80866	47µF	20%	6,3V
2793	4822 122 33809	22nF	20%	50V
2795	4822 122 33809	22nF	20%	50V
2796	4822 122 33809	22nF	20%	50V
2797	4822 122 33809	22nF	20%	50V
2798	4822 122 33809	22nF	20%	50V
2799	4822 122 33809	22nF	20%	50V
2800	4822 122 33809	22nF	20%	50V

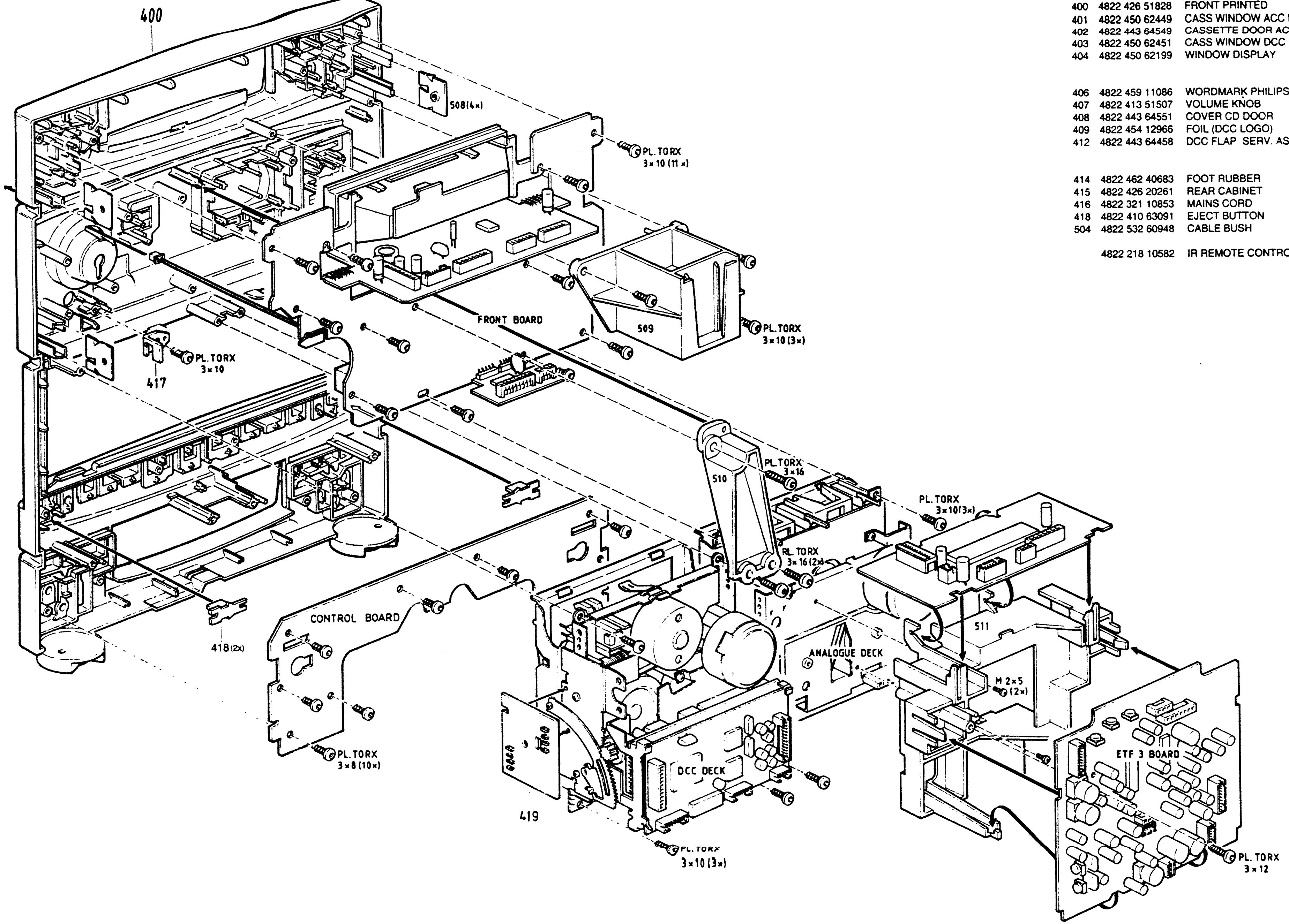
EXPLODED VIEW SET I

MECHANICAL PARTS

400	4822 426 51828	FRONT PRINTED
401	4822 450 62449	CASS WINDOW ACC DECK
402	4822 443 64549	CASSETTE DOOR ACC DECK
403	4822 450 62451	CASS WINDOW DCC DECK
404	4822 450 62199	WINDOW DISPLAY
406	4822 459 11086	WORDMARK PHILIPS
407	4822 413 51507	VOLUME KNOB
408	4822 443 64551	COVER CD DOOR
409	4822 454 12966	FOIL (DCC LOGO)
412	4822 443 64458	DCC FLAP SERV. ASSY
414	4822 462 40683	FOOT RUBBER
415	4822 426 20261	REAR CABINET
416	4822 321 10853	MAINS CORD
418	4822 410 63091	EJECT BUTTON
504	4822 532 60948	CABLE BUSH
	4822 218 10582	IR REMOTE CONTROL


PL.TORX 3×10(5×)
415
TORX M3×6(4×)
TORX M3×6
TORX M3×6 (2×)
502
TORX M3×6(4×)
TUNER BOARD
501
PL. TORX 3×10(2×)
TRANSFORMER BOARD
COMBI BOARD
A
TORX M3=6 (4×)
400
404
grey
black
500
503
TORX M3×6(2×)
416
TORX M3×6(4×)
402
406
407
408
CD-BRICK
CD BOARD
504
401
403
412
409
506
PL. TORX 2×6
414(4×)
TORX M3×6(3×)

EXPLODED VIEW SET 2


400
508(4×)
PL.TORX
3×10 (11×)
FRONT BOARD
509
PL.TORX
3×10(3×)
417
PL.TORX
3×10
510
PL.TORX
3×16
PL.TORX
3×10(3×)
RL.TORX
3×16(2×)
511
418(2×)
CONTROL BOARD
ANALOGUE DECK
M 2×5
(2×)
PL.TORX
3×8 (10×)
DCC DECK
ETF 3 BOARD
419
PL.TORX
3×10(3×)
PL.TORX
3×12

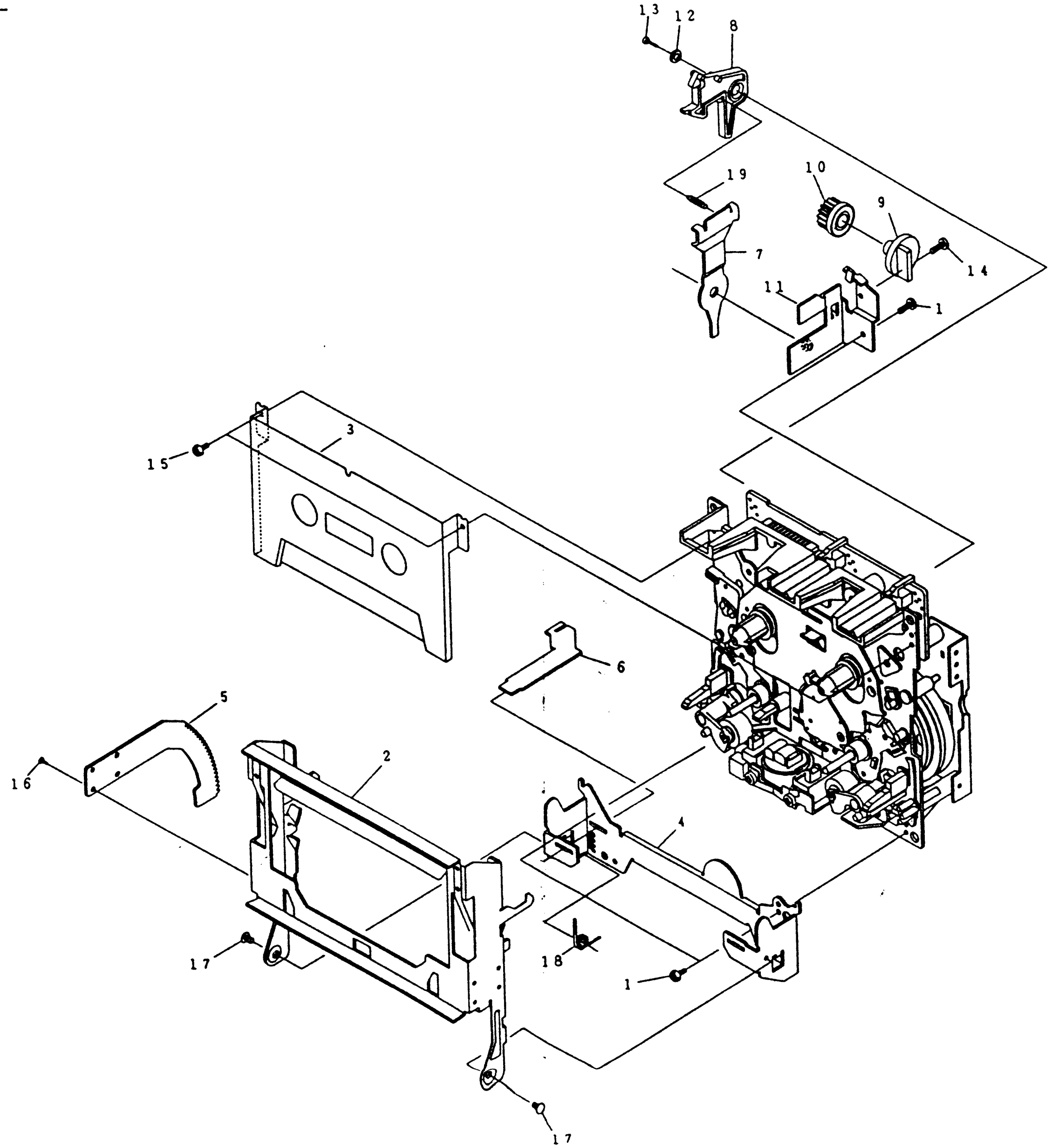
MECHANICAL PARTS

400	4822 426 51828	FRONT PRINTED
401	4822 450 62449	CASS WINDOW ACC DECK
402	4822 443 64549	CASSETTE DOOR ACC DECK
403	4822 450 62451	CASS WINDOW DCC DECK
404	4822 450 62199	WINDOW DISPLAY
406	4822 459 11086	WORDMARK PHILIPS
407	4822 413 51507	VOLUME KNOB
408	4822 443 64551	COVER CD DOOR
409	4822 454 12966	FOIL (DCC LOGO)
412	4822 443 64458	DCC FLAP SERV. ASSY
414	4822 462 40683	FOOT RUBBER
415	4822 426 20261	REAR CABINET
416	4822 321 10853	MAINS CORD
418	4822 410 63091	EJECT BUTTON
504	4822 532 60948	CABLE BUSH
	4822 218 10582	IR REMOTE CONTROL

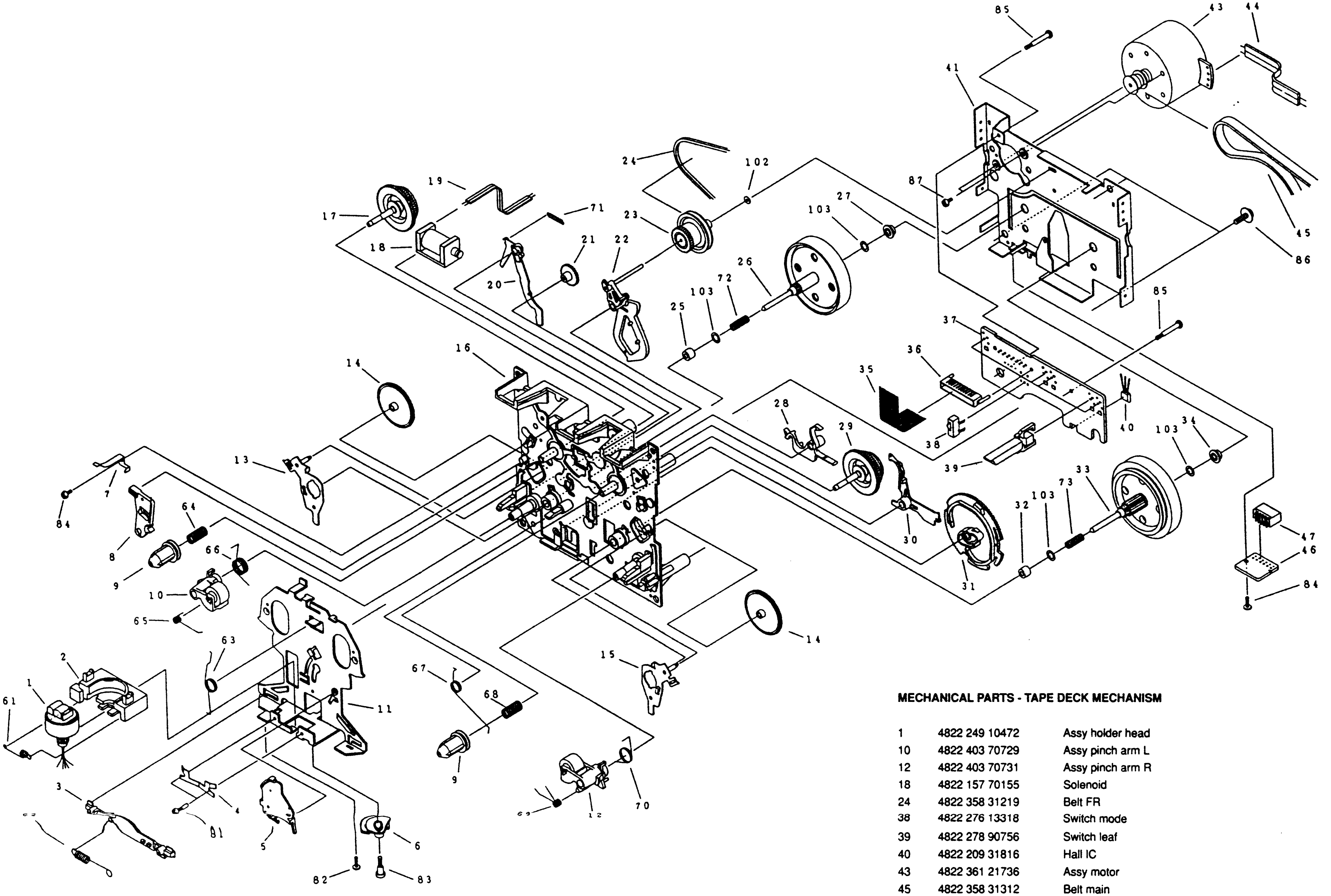
EXPLODED VIEW TAPE DECK MECHANISM

MECHANICAL PARTS

2	4822 691 20985	Flap assy
3	4822 426 20213	Plate cover
9	4822 256 92011	Holder gear
10	4822 529 10289	Damper


13
12
8
19
10
9
7
14
11
1
3
15
6
5
16
2
4
17
18
1
17

EXPLODED VIEW - TAPE DECK MECHANISM


85
43
44
41
87
45
86
24
102
19
71
17
18
23
27
103
21
22
20
26
72
103
25
85
37
36
35
16
14
28
29
40
103
34
38
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MECHANICAL PARTS - TAPE DECK MECHANISM

1	4822 249 10472	Assy holder head
10	4822 403 70729	Assy pinch arm L
12	4822 403 70731	Assy pinch arm R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch mode
39	4822 278 90756	Switch leaf
40	4822 209 31816	Hall IC
43	4822 361 21736	Assy motor
45	4822 358 31312	Belt main

ELECTRICAL PARTSLIST FRONT BOARD

MISCELLANEOUS

1401	4822 130 91476	DISPLAY
1410	4822 276 13114	TACT SWITCH
1411	4822 276 13114	TACT SWITCH
1412	4822 276 13114	TACT SWITCH
1413	4822 276 13114	TACT SWITCH
1414	4822 276 13114	TACT SWITCH
1415	4822 276 13114	TACT SWITCH
1416	4822 276 13114	TACT SWITCH
1417	4822 276 13114	TACT SWITCH
1418	4822 276 13114	TACT SWITCH
1419	4822 276 13114	TACT SWITCH
1420	4822 276 13114	TACT SWITCH
1421	4822 276 13114	TACT SWITCH
1422	4822 276 13114	TACT SWITCH
1423	4822 276 13114	TACT SWITCH
1424	4822 276 13114	TACT SWITCH
1425	4822 276 13114	TACT SWITCH
1426	4822 276 13114	TACT SWITCH
1428	4822 276 13114	TACT SWITCH
1429	4822 276 13114	TACT SWITCH
1430	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH

DIODES

6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6419	4822 130 30621	1N4148

TRANSISTORS

7410	5322 130 42136	BC848C(CHIP)
7460	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

6406	4822 214 52009	GP1U58XP
7401	4822 209 90286	TMP87PS71F
7402	4822 209 31508	ST24C01
7403	5322 209 10421	HEF4094BP
7420	5322 209 10421	HEF4094BP
7430	5322 209 11129	PCF8576T
7430	4822 209 10262	HEF4051BP
7451	4822 209 31515	BA3830S

COILS

5401	5322 242 73697	CERAM.RES. 8MHz
5402	4822 242 70938	CRYSTAL 32,768kHz
5404	4822 157 53447	BEAD INDUCTOR
5416	4822 157 62552	COIL 2,2µH
5418	4822 157 62552	COIL 2,2µH
5430	4822 157 62552	COIL 2.2µH

RESISTORS

3424	4822 116 90836	RES. NETWORK 5x 10k		
3431	4822 116 83864	10k	5%	0,5W
3434	4822 050 11002	1k	5%	0,2W
3437	4822 050 11002	1k	5%	0,2W
3439	4822 050 11002	1k	5%	0,2W
3446	4822 050 11002	1k	5%	0,2W
3447	4822 050 11002	1k	5%	0,2W
3448	4822 050 11002	1k	5%	0,2W
3449	4822 050 11002	1k	5%	0,2W
3452	4822 116 52222	390R	5%	0,16W
3453	4822 116 52224	470R	5%	0,5W
3454	4822 050 11002	1k	5%	0,2W
3455	4822 116 52224	470R	5%	0,5W
3457	4822 050 11002	1k	5%	0,2W
3459	4822 116 52284	47k	5%	0,5W
3461	4822 116 52219	330R	5%	0,5W
3464	4822 050 11002	1k	5%	0,2W
3475	4822 116 83864	10k	5%	0,5W
3493	4822 050 11002	1k	5%	0,2W
3514	4822 116 52283	4k7	5%	0,5W

CHIP RESISTORS

3402	4822 051 20681	680R	5%	0,1W
3403	4822 051 20104	100k	5%	0,1W
3404	4822 051 20103	10k	5%	0,1W
3406	4822 051 20222	2k2	5%	0,1W
3407	4822 051 10102	1k	2%	0,25W
3409	4822 051 10102	1k	2%	0,25W
3410	4822 051 10102	1k	2%	0,25W
3411	4822 051 10102	1k	2%	0,25W
3412	4822 051 10102	1k	2%	0,25W
3413	4822 051 10102	1k	2%	0,25W
3414	4822 051 10102	1k	2%	0,25W
3415	4822 051 20472	4k7	5%	0,1W
3416	4822 051 20103	10k	5%	0,1W
3417	4822 051 20103	10k	5%	0,1W
3418	4822 051 20103	10k	5%	0,1W
3419	4822 051 20103	10k	5%	0,1W
3420	4822 051 20103	10k	5%	0,1W
3421	4822 051 20223	22k	5%	0,1W
3423	4822 051 20472	4k7	5%	0,1W
3425	4822 051 20223	22k	5%	0,1W
3429	4822 051 20184	180k	5%	0,1W
3433	4822 051 10102	1k	2%	0,25W
3435	4822 051 20103	10k	5%	0,1W
3436	4822 051 20104	100k	5%	0,1W
3440	4822 051 20472	4k7	5%	0,1W
3441	4822 051 10102	1k	2%	0,25W
3442	4822 051 10102	1k	2%	0,25W
3445	4822 051 10102	1k	2%	0,25W
3450	4822 051 20103	10k	5%	0,1W
3451	4822 051 20472	4k7	5%	0,1W
3456	4822 051 20103	10k	5%	0,1W
3458	4822 051 10102	1k	2%	0,25W
3460	4822 051 20103	10k	5%	0,1W
3462	4822 051 20103	10k	5%	0,1W
3463	4822 051 20223	22k	5%	0,1W
3465	4822 051 10102	1k	2%	0,25W
3470	4822 051 20223	22k	5%	0,1W
3482	4822 051 20224	220k	5%	0,1W
3483	4822 051 20224	220k	5%	0,1W
3484	4822 117 11149	82k	1%	0,1W

ELECTRICAL PARTSLIST FRONT BOARD

CHIP RESISTORS

3486	4822 051 20103	10k	5%	0,1W
3487	4822 051 20103	10k	5%	0,1W
3488	4822 051 20103	10k	5%	0,1W
3489	4822 051 20103	10k	5%	0,1W
3490	4822 051 20103	10k	5%	0,1W
3491	4822 051 20103	10k	5%	0,1W
3492	4822 051 20103	10k	5%	0,1W
3496	4822 051 20103	10k	5%	0,1W
3497	4822 051 20103	10k	5%	0,1W
3498	4822 051 20103	10k	5%	0,1W
3499	4822 051 10102	1k	2%	0,25W
3500	4822 051 20223	22k	5%	0,1W
3502	4822 051 20103	10k	5%	0,1W
3510	4822 051 20103	10k	5%	0,1W
3511	4822 051 20103	10k	5%	0,1W
3512	4822 051 20103	10k	5%	0,1W
3513	4822 051 20103	10k	5%	0,1W
4401	4822 051 10008	CHIP JUMPER 1206		
4402	4822 051 10008	CHIP JUMPER 1206		
4403	4822 051 10008	CHIP JUMPER 1206		
4405	4822 051 10008	CHIP JUMPER 1206		
4406	4822 051 10008	CHIP JUMPER 1206		
4407	4822 051 10008	CHIP JUMPER 1206		
4408	4822 051 10008	CHIP JUMPER 1206		
4409	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2401	4822 124 41584	100µF	20%	10V
2402	4822 124 80818	22mF	20%	5,5V
2403	4822 124 41796	22µF	20%	16V
2406	4822 124 41584	100µF	20%	10V
2410	4822 124 40242	1µF	20%	63V
2470	4822 124 41407	0,47µF	20%	63V
2471	4822 124 41579	10µF	20%	50V

CHIP CAPACITORS

2400	4822 122 33496	100nF	10%	63V
2404	5322 122 32531	100pF	5%	50V
2405	5322 122 32654	22nF	10%	63V
2411	5322 122 32654	22nF	10%	63V
2412	5322 122 34123	1nF	10%	50V
2413	5322 122 32658	22pF	5%	50V
2414	5322 122 32658	22pF	5%	50V
2415	4822 122 33177	10nF	20%	50V
2417	5322 122 33538	150pF	5%	63V
2418	5322 122 33538	150pF	5%	63V
2419	4822 122 33496	100nF	10%	63V
2423	4822 122 33177	10nF	20%	50V
2424	5322 122 31863	330pF	5%	50V
2430	5322 122 32654	22nF	10%	63V
2440	5322 122 32654	22nF	10%	63V
2472	4822 122 33891	3,3nF	10%	63V
2473	5322 122 33538	150pF	5%	63V
2474	5322 122 32654	22nF	10%	63V
2475	5322 122 32654	22nF	10%	63V
2476	5322 122 32654	22nF	10%	63V
2477	4822 122 33496	100nF	10%	63V

ELECTRICAL PARTSLIST CONTROL BOARD

MISCELLANEOUS

1450	4822 276 13114	TACT SWITCH
1451	4822 276 13114	TACT SWITCH
1452	4822 276 13114	TACT SWITCH
1454	4822 276 13114	TACT SWITCH
1455	4822 276 13114	TACT SWITCH
1456	4822 276 13114	TACT SWITCH
1457	4822 276 13114	TACT SWITCH
1458	4822 276 13114	TACT SWITCH
1459	4822 276 13114	TACT SWITCH
1460	4822 276 13114	TACT SWITCH
1461	4822 276 13114	TACT SWITCH
1466	4822 276 13114	TACT SWITCH
1467	4822 276 13114	TACT SWITCH
1468	4822 276 13114	TACT SWITCH
1469	4822 276 13114	TACT SWITCH
1470	4822 276 13114	TACT SWITCH
1471	4822 276 13114	TACT SWITCH
1472	4822 276 13114	TACT SWITCH
1473	4822 276 13114	TACT SWITCH
1474	4822 276 13114	TACT SWITCH
1475	4822 276 13114	TACT SWITCH
1476	4822 276 13114	TACT SWITCH
1477	4822 276 13114	TACT SWITCH
1478	4822 276 13114	TACT SWITCH
1479	4822 276 13114	TACT SWITCH
1480	4822 276 13114	TACT SWITCH
1481	4822 276 13114	TACT SWITCH

DIODES

6450	4822 130 30621	1N4148
6451	4822 130 30621	1N4148
6452	4822 130 30621	1N4148
6454	4822 130 30621	1N4148
6455	4822 130 30621	1N4148
6456	4822 130 30621	1N4148
6457	4822 130 30621	1N4148

INTEGRATED CIRCUITS

7636	5322 209 10421	HEF4094BP

CAPACITORS

2450	4822 126 12882	100nF		50V
2451	4822 122 33197	1nF	10%	50V

MISCELLANEOUS

1101	4822 210 10492	FRONTEND ASSY
1110	4822 267 10283	SOCKET COAX IEC 75R

DIODES

6101	4822 130 34174	BZX79-B4V7
6102	4822 130 83075	HN1V02H
6110	4822 130 30621	1N4148

TRANSISTORS

7104	5322 130 60068	BC558C
7106	4822 130 41327	BC327-40
7107	5322 130 41982	BC848 (CHIP)
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848 (CHIP)
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7125	4822 130 44197	BC558B
7151	4822 130 60163	2SC1047

INTEGRATED CIRCUITS

7103	4822 209 31001	LA1851N
7105	4822 209 30178	LC7218

COILS

5103	4822 242 72342	CER. FILTER 10,7MHz
5104	4822 157 63029	AM IF COIL
5105	4822 157 63904	Q-DETECION COIL
5106	4822 157 71661	ANTI-BIRDY FILTER
5108	4822 157 63912	OSC.COIL AM 3-BAND
5110	4822 242 71878	CERAM.FILTER 450kHz
5111	4822 242 81248	CERAM. RES. 19kHz
5112	4822 242 72976	CER.RESONATOR 7,2MHz
5113	4822 242 72342	CER. FILTER 10,7MHz
5114	4822 157 51503	560µH
5127	4822 158 60643	FERROCEPTOR

RESISTORS

3101	4822 052 10478	4R7	5%	NFR
3113	4822 050 22201	220R	2%	0,25W
3118	4822 050 22201	220R	2%	0,25W
3120	4822 052 10229	22R	5%	0,33W
3125	4822 100 11213	22k	30%	POT.
3130	4822 116 52283	4k7	5%	0,5W
3131	4822 100 11319	4k7		trimpot.
3134	4822 116 52289	5k6	5%	0,16W
3137	4822 116 52283	4k7	5%	0,5W
3138	4822 116 83922	150R	5%	1W
3147	4822 116 52289	5k6	5%	0,16W
3150	4822 050 25601	560R	1%	0,6W
3151	4822 116 52283	4k7	5%	0,5W
3155	4822 050 22201	220R	2%	0,25W
3158	4822 116 52283	4k7	5%	0,5W
3162	4822 050 22701	270R	1%	0,6W
3165	4822 050 11002	1k	5%	0,2W
3166	4822 050 11002	1k	5%	0,2W
3167	4822 050 11002	1k	5%	0,2W
3225	4822 050 11002	1k	5%	0,2W

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3104	4822 051 20154	150k	5%	0,1W
3105	4822 051 20562	5k6	5%	0,1W
3106	4822 051 20829	82R	5%	0,1W
3107	4822 051 20008	CHIP JUMPER 0805		
3114	4822 051 20332	3k3	5%	0,1W
3115	4822 051 20391	390R	5%	0,1W
3116	4822 051 20478	4R7	5%	0,1W
3117	4822 051 20331	330R	5%	0,1W
3121	4822 051 20272	2k7	5%	0,1W
3122	4822 051 20562	5k6	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3124	4822 117 10833	10k	1%	0,1W
3126	4822 051 20123	12k	2%	0,1W
3127	4822 051 20182	1k8	5%	0,1W
3128	4822 051 20182	1k8	5%	0,1W
3129	4822 051 20822	8k2	5%	0,1W
3132	4822 117 10833	10k	1%	0,1W
3133	4822 051 20008	CHIP JUMPER 0805		
3135	4822 051 10008	CHIP JUMPER 1206		
3139	4822 051 20008	CHIP JUMPER 0805		
3141	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20472	4k7	5%	0,1W
3143	4822 051 20821	820R	5%	0,1W
3144	4822 051 20331	330R	5%	0,1W
3145	4822 051 20271	270R	5%	0,1W
3148	4822 051 20104	100k	5%	0,1W
3149	4822 051 20472	4k7	5%	0,1W
3152	4822 117 10833	10k	1%	0,1W
3153	4822 051 20274	270k	5%	0,1W
3156	4822 051 20153	15k	5%	0,1W
3157	4822 051 20472	4k7	5%	0,1W
3159	4822 051 20104	100k	5%	0,1W
3160	4822 051 20104	100k	5%	0,1W
3163	4822 117 10833	10k	1%	0,1W
3164	4822 051 10473	47k	2%	0,25W
3164	4822 051 20473	47k	5%	0,1W
3168	4822 051 20008	CHIP JUMPER 0805		
3170	4822 117 10833	10k	1%	0,1W
3171	4822 051 20223	22k	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3173	4822 051 20223	22k	5%	0,1W
3190	4822 051 20479	47R	5%	0,1W
3194	4822 051 20472	4k7	5%	0,1W
3196	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20008	CHIP JUMPER 0805		
3198	4822 117 10833	10k	1%	0,1W
3199	4822 051 20471	470R	5%	0,1W
3200	4822 051 20008	CHIP JUMPER 0805		
3201	4822 051 20472	4k7	5%	0,1W
3202	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20474	470k	5%	0,1W
3229	4822 051 20008	CHIP JUMPER 0805		
3229	4822 051 20008	CHIP JUMPER 0805		
3233	4822 051 10102	1k	2%	0,25W
3236	4822 051 20008	CHIP JUMPER 0805		
3238	4822 051 20008	CHIP JUMPER 0805		
3238	4822 051 20008	CHIP JUMPER 0805		
3239	4822 051 20274	270k	5%	0,1W
3240	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2103	4822 124 40433	47µF	20%	25V
2104	4822 121 42408	220nF	5%	63V
2114	5322 124 41431	22µF	20%	25V
2115	4822 124 40239	0,47µF	20%	63V
2116	5322 121 42386	100nF	5%	63V
2119	4822 124 40244	2,2µF	20%	63V
2120	4822 124 40244	2,2µF	20%	63V
2121	4822 124 40196	220µF	20%	16V
2123	4822 124 40246	4,7µF	20%	63V
2124	4822 124 40246	4,7µF	20%	63V
2129	4822 124 40242	1µF	20%	63V
2131	4822 124 40248	10µF	20%	63V
2142	4822 125 60102	30pF		VARIABLE
2144	4822 121 42408	220nF	5%	63V
2145	4822 121 51263	510pF	1%	400V
2146	4822 121 70082	430pF	1%	400V
2152	4822 124 40242	1µF	20%	63V
2156	4822 124 40433	47µF	20%	25V
2160	4822 124 41631	1,5µF	20%	50V
2162	4822 126 11585	22nF		50V
2193	4822 125 60102	30pF		VARIABLE
2194	4822 125 60101	10pF		VARIABLE
2210	4822 124 41643	100µF	20%	16V

CHIP CAPACITORS

2101	5322 122 34099	470pF	10%	63V
2102	5322 122 32268	470pF	10%	50V
2105	5322 122 32654	22nF	10%	63V
2108	5322 122 32654	22nF	10%	63V
2109	5322 122 32654	22nF	10%	63V
2110	5322 122 32654	22nF	10%	63V
2111	4822 122 32927	220nF	10%	63V
2112	5322 122 32654	22nF	10%	63V
2113	5322 122 32661	56pF	5%	50V
2117	4822 122 33336	8,2nF	10%	50V
2118	4822 122 33336	8,2nF	10%	50V
2125	4822 122 33177	10nF	20%	50V
2126	4822 122 31782	15nF	10%	50V
2127	5322 122 31863	330pF	5%	50V
2128	5322 116 80853	560pF	5%	63V
2132	5322 122 32268	470pF	10%	50V
2133	5322 126 10794	220pF	10%	
2135	4822 122 33128	15nF	10%	63V
2147	5322 122 32654	22nF	10%	63V
2148	5322 122 32452	47pF	5%	50V
2149	4822 122 33177	10nF	20%	50V
2150	5322 122 32654	22nF	10%	63V
2151	5322 122 34099	470pF	10%	63V
2151	4822 122 33219	1,8nF	10%	50V
2153	5322 122 34099	470pF	10%	63V
2154	5322 122 32481	15pF	5%	50V
2155	5322 122 32965	18pF	5%	50V
2158	5322 126 10223	4,7nF	10%	63V
2159	5322 126 10223	4,7nF	10%	63V
2161	4822 122 32927	220nF	10%	63V
2188	5322 122 32654	22nF	10%	63V
2195	5322 122 33861	120pF	5%	NP0
2196	5322 122 32448	10pF	5%	50V
2215	5322 122 32268	470pF	10%	50V
2216	5322 122 32268	470pF	10%	50V
2221	5322 122 32268	470pF	10%	50V
2224	4822 122 33575	220pF	5%	50V
2225	4822 122 33575	220pF	5%	50V

MECHANICAL PARTS

	4822 255 40128	CLIP TO126
	4822 255 40128	CLIP TO126

MISCELLANEOUS

1284	4822 071 51252	FUSE 1.25A
1285	4822 071 52002	FUSE T2A
1286	4822 071 54002	FUSE T4A
1287	4822 071 54002	FUSE T4A
1304	4822 267 31176	SPEAKER TERMINAL
1496	4822 134 41171	LAMP
1497	4822 134 41171	LAMP
1498	4822 134 41171	LAMP
1499	4822 134 41171	LAMP
1550	4822 267 31792	HEADPHONE SOCKET
1552	4822 267 30631	CINCH SOCKET
1580	4822 277 21792	SLIDE SWITCH
5280	4822 146 21816	TRANSF.MAINS
5313	4822 280 80777	RELAY

DIODES

6250	4822 130 82078	D5SBA20
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148
6253	4822 130 34173	BZX79-C5V6
6254	4822 130 30621	1N4148
6259	4822 130 30621	1N4148
6260	5322 130 30684	1N4002
6261	4822 130 34233	BZX79-B5V1
6262	5322 130 30684	1N4002
6266	4822 130 30621	1N4148
6267	4822 130 34173	BZX79-C5V6
6268	5322 130 30684	1N4002
6269	5322 130 30684	1N4002
6270	4822 130 30621	1N4148
6278	4822 130 82079	D3SBA20
6279	4822 130 82079	D3SBA20
6352	4822 130 30621	1N4148
6504	4822 130 30621	1N4148
6505	4822 130 30621	1N4148
6507	4822 130 30861	BZX79-C7V5
6508	4822 130 30861	BZX79-C7V5
6509	5322 130 34563	BZX79-C2V7
6510	4822 130 30621	1N4148
6511	4822 130 30621	1N4148

TRANSISTORS

7250	4822 130 40937	BC548B
7252	4822 130 60089	BD 436
7253	4822 130 40937	BC548B
7254	4822 130 40937	BC548B
7255	4822 130 44197	BC558B
7256	4822 130 40937	BC548B
7318	4822 130 44197	BC558B
7319	4822 130 40937	BC548B
7320	4822 130 40937	BC548B
7505	4822 130 44246	BC549C
7506	4822 130 44246	BC549C
7513	5322 130 44779	BC338-40
7514	5322 130 44779	BC338-40
7521	5322 130 44779	BC338-40
7522	5322 130 44779	BC338-40

TRANSISTORS

7523	4822 130 41715	BC328-40
7524	4822 130 41715	BC328-40
7525	4822 130 40937	BC548B
7526	4822 130 40937	BC548B
7529	4822 130 44196	BC548C
7530	4822 130 44196	BC548C
7535	4822 130 44196	BC548C
7536	4822 130 40982	BD433
7553	4822 130 62388	2SA1160B
7554	4822 130 41715	BC328-40
7571	4822 130 44197	BC558B
7572	4822 130 44197	BC558B
7575	4822 130 44246	BC549C
7576	4822 130 44246	BC549C
7577	4822 130 44246	BC549C
7578	4822 130 44246	BC549C
7583	4822 130 41327	BC327-40
7584	4822 130 44246	BC549C
7585	4822 130 44246	BC549C
7586	4822 130 40937	BC548B
7587	4822 130 40937	BC548B
7588	4822 130 44197	BC558B
7590	4822 130 44196	BC548C
7636	4822 130 40937	BC548B

INTEGRATED CIRCUITS

7257	4822 209 72042	MC78L05ACP
7258	4822 209 80817	L7805CV
7350	4822 209 31514	STK4132II
7502	5322 209 10421	HEF4094BP
7551	4822 209 10263	HEF4052BP
7552	4822 209 10263	HEF4052BP
7581	5322 209 14865	MC14066BCP
7582	5322 209 14865	MC14066BCP

COILS

5281	4822 157 71285	400μH
5300	4822 157 62552	COIL 2,2μH
5371	4822 157 53447	BEAD INDUCTOR
5372	4822 157 53447	BEAD INDUCTOR
5373	4822 157 62552	COIL 2,2μH
5374	4822 157 62552	COIL 2,2μH

RESISTORS

3250	4822 116 52224	470R	5%	0,5W
3251	4822 116 52276	3k9	5%	0,5W
3252	4822 116 83864	10k	5%	0,5W
3253	4822 116 52175	100R	5%	0,5W
3254	4822 116 52283	4k7	5%	0,5W
3255	4822 116 52224	470R	5%	0,5W
3256	4822 116 52224	470R	5%	0,5W
3257	4822 116 83864	10k	5%	0,5W
3258	4822 050 11002	1k	5%	0,2W
3259	4822 116 83882	39k	5%	0,5W
3260	4822 116 52276	3k9	5%	0,5W
3261	4822 116 52284	47k	5%	0,5W
3262	4822 050 11002	1k	5%	0,2W
3263	4822 050 11002	1k	5%	0,2W
3264	4822 116 52234	100k	5%	0,5W
3265	4822 116 83864	10k	5%	0,5W
3266	4822 050 11002	1k	5%	0,2W
3269	4822 116 52283	4k7	5%	0,5W
3271	4822 050 11002	1k	5%	0,2W
3301	4822 116 52256	2k2	5%	0,16W

RESISTORS

3303	4822 116 52234	100k	5%	0,5W
3304	4822 116 52263	2k7	5%	0,5W
3351	4822 053 10221	220R	5%	1W
3360	4822 052 10101	100R	5%	NFR
3361	4822 050 11002	1k	5%	0.2W
3362	4822 050 11002	1k	5%	0.2W
3363	4822 116 52263	2k7	5%	0.5W
3368	4822 113 80525	0R15	10%	3W
3371	4822 116 83864	10k	5%	0,5W
3372	4822 116 83864	10k	5%	0.5W
3373	4822 116 52291	56k	5%	0.5W
3374	4822 116 52291	56k	5%	0.5W
3375	4822 116 52224	470R	5%	0.5W
3376	4822 116 52224	470R	5%	0.5W
3377	4822 052 10478	4R7	5%	NFR
3378	4822 052 10478	4R7	5%	NFR
3379	4822 116 52256	2k2	5%	0,16W
3380	4822 116 52256	2k2	5%	0.16W
3381	4822 116 52256	2k2	5%	0,16W
3382	4822 116 52256	2k2	5%	0.16W
3383	4822 052 10108	1R	5%	0,33W
3384	4822 052 10108	1R	5%	0,33W
3385	4822 116 52291	56k	5%	0,5W
3386	4822 116 52291	56k	5%	0,5W
3387	4822 116 52213	180R	5%	0,5W
3388	4822 116 52213	180R	5%	0.5W
3389	4822 116 52217	270R	5%	0,5W
3390	4822 116 52217	270R	5%	0.5W
3399	4822 116 52244	15k	5%	0,5W
3400	4822 116 83864	10k	5%	0,5W
3401	4822 050 21008	1R	1%	0,6W
3402	4822 050 21008	1R	1%	0,6W
3403	4822 050 21008	1R	1%	0,6W
3404	4822 050 21008	1R	1%	0,6W
3405	4822 050 21008	1R	1%	0,6W
3406	4822 050 21008	1R	1%	0,6W
3407	4822 050 21008	1R	1%	0,6W
3408	4822 050 21008	1R	1%	0,6W
3409	4822 050 21008	1R	1%	0,6W
3410	4822 050 21008	1R	1%	0.6W
3411	4822 116 52284	47k	5%	0,5W
3412	4822 116 52284	47k	5%	0,5W
3415	4822 116 52291	56k	5%	0,5W
3416	4822 116 52291	56k	5%	0.5W
3501	4822 116 52283	4k7	5%	0,5W
3502	4822 116 52283	4k7	5%	0,5W
3503	4822 116 52251	18k	5%	0,5W
3504	4822 116 52251	18k	5%	0,5W
3505	4822 116 52283	4k7	5%	0,5W
3506	4822 116 52283	4k7	5%	0,5W
3507	4822 116 52276	3k9	5%	0,5W
3508	4822 116 52276	3k9	5%	0.5W
3509	4822 116 52296	6k8	5%	0,5W
3510	4822 116 52296	6k8	5%	0,5W
3511	4822 116 52249	1k8	5%	0,16W
3512	4822 116 52249	1k8	5%	0,16W
3513	4822 116 52235	1M	5%	0,5W
3514	4822 116 52235	1M	5%	0,5W
3523	4822 116 52175	100R	5%	0,5W
3524	4822 116 52175	100R	5%	0,5W

RESISTORS

3527	4822 116 52285	470k	5%	0,5W
3528	4822 116 52285	470k	5%	0,5W
3529	4822 116 52269	3k3	5%	0,5W
3530	4822 116 52269	3k3	5%	0,5W
3531	4822 050 11002	1k	5%	0,2W
3532	4822 050 11002	1k	5%	0,2W
3535	4822 116 52224	470R	5%	0,5W
3536	4822 116 52224	470R	5%	0,5W
3537	4822 116 52224	470R	5%	0,5W
3538	4822 050 11002	1k	5%	0,2W
3539	4822 050 11002	1k	5%	0,2W
3540	4822 116 52235	1M	5%	0,5W
3541	4822 116 52235	1M	5%	0,5W
3542	4822 116 52235	1M	5%	0,5W
3543	4822 116 52215	220R	5%	0,16W
3545	4822 116 52234	100k	5%	0,5W
3546	4822 116 52234	100k	5%	0,5W
3547	4822 116 52269	3k3	5%	0,5W
3548	4822 116 52269	3k3	5%	0,5W
3554	4822 116 52243	1k5	5%	0,16W
3555	4822 116 52234	100k	5%	0,5W
3556	4822 050 11002	1k	5%	0,2W
3557	4822 116 83864	10k	5%	0,5W
3565	4822 116 52263	2k7	5%	0,5W
3566	4822 116 52263	2k7	5%	0,5W
3567	4822 116 52222	390R	5%	0,16W
3568	4822 116 52222	390R	5%	0,16W
3569	4822 116 52235	1M	5%	0,5W
3570	4822 116 52235	1M	5%	0,5W
3571	4822 116 52271	33k	5%	0,16W
3572	4822 052 10339	33R	5%	NFR
3573	4822 116 52256	2k2	5%	0,16W
3574	4822 116 52256	2k2	5%	0,16W
3575	4822 116 52243	1k5	5%	0,16W
3576	4822 116 52243	1k5	5%	0,16W
3577	4822 116 52292	560k	5%	0,16W
3578	4822 116 52292	560k	5%	0,16W
3579	4822 116 52271	33k	5%	0,16W
3580	4822 116 52271	33k	5%	0,16W
3581	4822 116 52271	33k	5%	0,16W
3582	4822 116 52271	33k	5%	0,16W
3583	4822 116 52271	33k	5%	0,16W
3584	4822 116 52271	33k	5%	0,16W
3585	4822 116 83864	10k	5%	0,5W
3587	4822 116 52285	470k	5%	0,5W
3588	4822 116 52285	470k	5%	0,5W
3589	4822 116 52285	470k	5%	0,5W
3590	4822 116 52285	470k	5%	0,5W
3591	4822 116 52285	470k	5%	0,5W
3592	4822 116 52285	470k	5%	0,5W
3593	4822 116 52285	470k	5%	0,5W
3594	4822 116 52285	470k	5%	0,5W
3595	4822 116 52292	560k	5%	0,16W
3596	4822 116 52292	560k	5%	0,16W
3597	4822 116 52222	390R	5%	0,16W
3598	4822 116 52222	390R	5%	0,16W
3599	4822 116 52243	1k5	5%	0,16W
3600	4822 116 52243	1k5	5%	0,16W
3601	4822 116 52257	22k	5%	0,5W
3602	4822 116 52257	22k	5%	0,5W

RESISTORS

3607	4822 116 52285	470k	5%	0,5W
3608	4822 116 52285	470k	5%	0,5W
3609	4822 116 52285	470k	5%	0,5W
3610	4822 116 52285	470k	5%	0,5W
3611	4822 116 52235	1M	5%	0,5W
3612	4822 116 52235	1M	5%	0,5W
3613	4822 050 11002	1k	5%	0,2W
3614	4822 050 11002	1k	5%	0,2W
3615	4822 116 52222	390R	5%	0,16W
3616	4822 116 52222	390R	5%	0,16W
3617	4822 116 52222	390R	5%	0,16W
3618	4822 116 52222	390R	5%	0,16W
3619	4822 050 11002	1k	5%	0,2W
3620	4822 050 11002	1k	5%	0,2W
3621	4822 050 11002	1k	5%	0,2W
3622	4822 050 11002	1k	5%	0,2W
3623	4822 116 52257	22k	5%	0,5W
3624	4822 116 52257	22k	5%	0,5W
3625	4822 116 52263	2k7	5%	0,5W
3626	4822 116 52263	2k7	5%	0,5W
3627	4822 116 52222	390R	5%	0,16W
3628	4822 116 52222	390R	5%	0,16W
3629	4822 102 10414	POTM.		2x20kB
3681	4822 116 52175	100R	5%	0,5W
3682	4822 116 52175	100R	5%	0,5W
3683	4822 116 52175	100R	5%	0,5W
3684	4822 116 52175	100R	5%	0,5W
3685	4822 116 83864	10k	5%	0,5W
3686	4822 116 83864	10k	5%	0,5W
3688	4822 116 83864	10k	5%	0,5W
3689	4822 116 83864	10k	5%	0,5W
3690	4822 116 52256	2k2	5%	0,16W
3691	4822 116 52256	2k2	5%	0,16W
3692	4822 116 52215	220R	5%	0,16W
3693	4822 116 52215	220R	5%	0,16W
3696	4822 116 52207	1k2	5%	0,5W
3697	4822 116 52207	1k2	5%	0,5W
3698	4822 116 52224	470R	5%	0,5W
3699	4822 116 52283	4k7	5%	0,5W
3700	4822 116 52283	4k7	5%	0,5W
3701	4822 116 52283	4k7	5%	0,5W
3702	4822 116 52235	1M	5%	0,5W
3703	4822 116 52235	1M	5%	0,5W
3706	4822 116 52283	4k7	5%	0,5W
3709	4822 116 83882	39k	5%	0,5W
3710	4822 116 52283	4k7	5%	0,5W
3711	4822 116 83882	39k	5%	0,5W
3712	4822 116 52207	1k2	5%	0,5W
3713	4822 116 52207	1k2	5%	0,5W
3714	4822 050 11002	1k	5%	0,2W
3715	4822 116 52271	33k	5%	0,16W
3716	4822 116 52283	4k7	5%	0,5W
3717	4822 050 11002	1k	5%	0,2W
3718	4822 050 11002	1k	5%	0,2W
3720	4822 116 52244	15k	5%	0,5W
3721	4822 116 52244	15k	5%	0,5W
3723	4822 116 52271	33k	5%	0,16W
3724	4822 116 52249	1k8	5%	0,16W
3725	4822 116 52283	4k7	5%	0,5W
3726	4822 116 52234	100k	5%	0,5W

RESISTORS

3730	4822 116 52228	680R	5%	0,5W
3731	4822 116 52228	680R	5%	0,5W
3732	4822 116 52224	470R	5%	0,5W
3733	4822 116 52257	22k	5%	0,5W

CAPACITORS

2252	4822 122 33197	1nF	10%	50V
2253	4822 122 33197	1nF	10%	50V
2254	4822 124 40433	47µF	20%	25V
2255	4822 122 33519	470pF	10%	50V
2256	4822 126 11585	22nF		50V
2257	4822 124 42118	1000µF	20%	25V
2258	5322 121 42386	100nF	5%	63V
2259	5322 121 42386	100nF	5%	63V
2260	4822 124 42119	4700µF	20%	25V
2262	4822 124 40201	1000µF	20%	16V
2263	4822 124 40242	1µF	20%	63V
2264	5322 121 42386	100nF	5%	63V
2265	4822 124 41525	100µF	20%	25V
2266	4822 124 40433	47µF	20%	25V
2271	4822 124 42367	3300µF	20%	35V
2272	4822 124 42367	3300µF	20%	35V
2274	5322 121 42386	100nF	5%	63V
2275	5322 121 42386	100nF	5%	63V
2277	4822 121 42007	100nF	10%	100V
2364	4822 124 41596	22µF	20%	50V
2365	4822 126 12785	47nF		50V
2366	4822 124 22347	47µF	20%	50V
2367	4822 126 12785	47nF		50V
2368	4822 124 41596	22µF	20%	50V
2369	4822 124 41407	0,47µF	20%	63V
2370	4822 124 41407	0,47µF	20%	63V
2371	4822 124 41576	2,2µF	20%	50V
2372	4822 124 41576	2,2µF	20%	50V
2373	4822 122 10466	220pF	10%	
2374	4822 122 10466	220pF	10%	
2375	4822 124 40433	47µF	20%	25V
2376	4822 124 40433	47µF	20%	25V
2377	4822 122 10459	560pF	10%	50V
2378	4822 122 10459	560pF	10%	50V
2379	4822 122 33197	1nF	10%	50V
2380	4822 122 33197	1nF	10%	50V
2381	4822 126 12145	47nF	10%	25V
2382	4822 126 12145	47nF	10%	25V
2385	4822 126 12145	47nF	10%	25V
2386	4822 126 12145	47nF	10%	25V
2387	4822 124 22347	47µF	20%	50V
2388	4822 124 22347	47µF	20%	50V
2389	4822 121 41854	150nF	10%	63V
2390	4822 121 41854	150nF	10%	63V
2391	4822 124 41407	0,47µF	20%	63V
2392	4822 124 41407	0,47µF	20%	63V
2501	4822 122 33197	1nF	10%	50V
2502	4822 122 33197	1nF	10%	50V
2503	4822 122 33197	1nF	10%	50V
2504	4822 122 33197	1nF	10%	50V
2505	4822 126 12339	2,2nF	10%	16V
2506	4822 126 12339	2,2nF	10%	16V
2507	4822 122 33519	470pF	10%	50V
2508	4822 122 33519	470pF	10%	50V
2509	4822 124 40242	1µF	20%	63V

CAPACITORS

2510	4822 124 40242	1µF	20%	63V
2515	4822 124 40242	1µF	20%	63V
2516	4822 124 40242	1µF	20%	63V
2517	4822 122 33195	100pF	10%	50V
2518	4822 122 33195	100pF	10%	50V
2519	4822 124 40433	47µF	20%	25V
2520	4822 124 40433	47µF	20%	25V
2521	4822 126 12145	47nF	10%	25V
2522	4822 126 12145	47nF	10%	25V
2552	4822 124 41525	100µF	20%	25V
2571	4822 122 33069	33pF	5%	50V
2572	4822 124 22263	220µF	20%	25V
2575	4822 124 40242	1µF	20%	63V
2576	4822 124 40242	1µF	20%	63V
2577	4822 124 40242	1µF	20%	63V
2578	4822 124 40242	1µF	20%	63V
2579	4822 124 40242	1µF	20%	63V
2580	4822 124 40242	1µF	20%	63V
2581	4822 124 40242	1µF	20%	63V
2582	4822 124 40242	1µF	20%	63V
2583	4822 126 12333	100nF	20%	25V
2584	4822 126 12333	100nF	20%	25V
2585	4822 121 51252	470nF	5%	63V
2586	4822 121 51252	470nF	5%	63V
2587	4822 121 43526	47nF	5%	100V
2588	4822 121 43526	47nF	5%	100V
2591	4822 122 10577	3,3nF	10%	16V
2592	4822 122 10577	3,3nF	10%	16V
2593	5322 121 42465	68nF	10%	63V
2594	5322 121 42465	68nF	10%	63V
2595	4822 126 12145	47nF	10%	25V
2596	4822 126 12145	47nF	10%	25V
2597	4822 126 12333	100nF	20%	25V
2600	4822 124 22263	220µF	20%	25V
2601	4822 126 12333	100nF	20%	25V
2602	4822 126 12333	100nF	20%	25V
2603	4822 124 41579	10µF	20%	50V
2605	4822 124 41525	100µF	20%	25V
2607	4822 122 33195	100pF	10%	50V
2608	4822 122 33195	100pF	10%	50V
2609	4822 122 33519	470pF	10%	50V
2615	4822 126 12333	100nF	20%	25V
2616	4822 122 33848	47pF	5%	50V
2617	4822 122 33848	47pF	5%	50V
2657	4822 124 40242	1µF	20%	63V
2662	4822 124 40246	4,7µF	20%	63V
2663	4822 124 40246	4,7µF	20%	63V
2666	4822 124 41579	10µF	20%	50V
2667	4822 124 41579	10µF	20%	50V
2668	4822 126 12339	2,2nF	10%	16V
2669	4822 126 12339	2,2nF	10%	16V
2670	4822 126 12145	47nF	10%	25V
2671	4822 126 12145	47nF	10%	25V
2672	4822 126 11714	4,7nF	20%	
2673	4822 124 40242	1µF	20%	63V
2674	4822 126 12785	47nF		50V
2675	4822 124 41995	6800µF		25V
2676	5322 121 42386	100nF	5%	63V
2677	5322 121 42386	100nF	5%	63V
2678	5322 121 42386	100nF	5%	63V

CAPACITORS

2679	5322 121 42386	100nF	5%	63V
2680	4822 124 41397	47µF	20%	25V
2681	4822 124 40246	4,7µF	20%	63V
2682	4822 124 40246	4,7µF	20%	63V
2683	4822 124 40201	1000µF	20%	16V
2684	4822 124 41995	6800µF		25V
2685	4822 124 41579	10µF	20%	50V
2686	4822 124 41579	10µF	20%	50V
2687	4822 122 10459	560pF	10%	50V
2688	4822 126 12785	47nF		50V

DIODES

6650	4822 130 34233	BZX79-B5V1
6760	4822 130 61219	BZX79-C10
6781	5322 130 30684	1N4002
6782	4822 130 30621	1N4148
6783	4822 130 30621	1N4148
6784	4822 130 30621	1N4148

TRANSISTORS

7652	5322 130 42136	BC848C(CHIP)
7653	5322 130 42136	BC848C(CHIP)
7654	5322 130 42136	BC848C(CHIP)
7655	5322 130 42136	BC848C(CHIP)
7760	5322 130 44779	BC338-40
7761	5322 130 44779	BC338-40
7762	4822 130 44196	BC548C
7763	4822 130 44196	BC548C
7781	4822 130 41715	BC328-40
7782	4822 130 41715	BC328-40
7784	5322 130 42136	BC848C(CHIP)
7785	5322 130 42136	BC848C(CHIP)
7787	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7650	4822 209 32919	HEF4952BT
7651	4822 209 72546	CXA1101
7701	4822 209 61667	UPC1330HA
7702	4822 209 32918	AN7318S
7703	5322 209 11102	HEF4052BT
7730	4822 209 31505	CXA1298AP
7764	4822 130 42682	DTA144ES
7765	4822 130 60588	DTC114ES
7792	4822 209 72042	MC78L05ACP
7793	4822 209 33623	MC68HC05C4 ETF3

COILS

5650	4822 156 21725	MPX FILTER
5651	4822 156 21725	MPX FILTER
5730	4822 156 20811	COIL 36µH
5731	4822 156 20811	COIL 36µH
5760	4822 156 20946	OSC.COIL 100kHz
5780	4822 242 72527	CERAMIC RES. 4.0 MHz
5790	4822 157 53941	100µH

RESISTORS

3652	4822 100 11771	POTMETER		20kLIN
3653	4822 100 11771	POTMETER		20kLIN
3654	4822 100 11771	POTMETER		20kLIN
3655	4822 100 11771	POTMETER		20kLIN
3658	4822 050 11002	1k	5%	0,2W
3659	4822 050 11002	1k	5%	0,2W
3660	4822 050 11002	1k	5%	0,2W
3661	4822 050 11002	1k	5%	0,2W
3666	4822 116 52264	27k	5%	0,5W
3667	4822 116 52264	27k	5%	0,5W
3674	4822 052 10478	4R7	5%	NFR
3700	4822 116 52224	470R	5%	0.5W
3701	4822 116 52224	470R	5%	0.5W
3703	4822 116 52224	470R	5%	0,5W
3708	4822 116 83864	10k	5%	0,5W

RESISTORS

3710	4822 116 52289	5k6	5%	0.16W
3722	4822 116 52224	470R	5%	0.5W
3723	4822 116 52224	470R	5%	0.5W
3724	4822 116 52245	150k	5%	0.16W
3730	4822 116 83864	10k	5%	0.5W
3731	4822 116 83864	10k	5%	0.5W
3732	4822 116 52175	100R	5%	0,5W
3733	4822 116 52175	100R	5%	0.5W
3734	4822 116 52284	47k	5%	0.5W
3735	4822 116 52284	47k	5%	0.5W
3736	4822 116 83864	10k	5%	0.5W
3737	4822 116 83864	10k	5%	0.5W
3738	4822 100 11771	POTMETER		20kLIN
3739	4822 100 11771	POTMETER		20kLIN
3748	4822 116 52271	33k	5%	0.16W
3749	4822 116 52219	330R	5%	0.5W
3762	4822 100 11163	TRIMPOT.		100k lin.
3763	4822 100 11163	TRIMPOT.		100k lin.
3773	4822 052 10478	4R7	5%	NFR
3774	4822 116 52257	22k	5%	0,5W
3792	4822 116 52284	47k	5%	0,5W
3793	4822 116 52284	47k	5%	0,5W
3800	4822 050 11002	1k	5%	0,2W
3801	4822 050 11002	1k	5%	0,2W
3802	4822 050 11002	1k	5%	0,2W
3803	4822 116 52175	100R	5%	0,5W
3804	4822 116 52215	220R	5%	0,16W
3822	4822 050 11002	1k	5%	0.2W
3823	4822 050 11002	1k	5%	0,2W
3824	4822 050 11002	1k	5%	0.2W
3825	4822 050 11002	1k	5%	0,2W
3826	4822 050 11002	1k	5%	0,2W
3837	4822 116 83864	10k	5%	0,5W
3839	4822 052 10159	15R	5%	0,33W
3856	4822 116 83864	10k	5%	0,5W

CHIP RESISTORS

3501	4822 051 10008	CHIP JUMPER1206		
3650	4822 051 20104	100k	5%	0,1W
3651	4822 051 20104	100k	5%	0,1W
3656	4822 051 10102	1k	2%	0,25W
3657	4822 051 10102	1k	2%	0,25W
3662	4822 051 20562	5k6	5%	0,1W
3663	4822 051 20562	5k6	5%	0,1W
3664	4822 051 20153	15k	5%	0,1W
3665	4822 051 20153	15k	5%	0,1W
3673	4822 051 20393	39k	5%	0,1W
3675	4822 117 11139	1k5	5%	0,1W
3678	4822 051 20474	470k	5%	0,1W
3679	4822 051 20474	470k	5%	0,1W
3680	4822 117 11139	1k5	5%	0,1W
3681	4822 117 11139	1k5	5%	0,1W
3682	4822 051 20471	470R	5%	0,1W
3688	4822 051 20332	3k3	5%	0,1W
3689	4822 051 20332	3k3	5%	0,1W
3690	4822 051 20008	CHIP JUMPER 0805		
3691	4822 051 20008	CHIP JUMPER 0805		
3692	4822 051 20008	CHIP JUMPER 0805		
3693	4822 051 20008	CHIP JUMPER 0805		
3694	4822 051 20223	22k	5%	0,1W

CHIP RESISTORS

3695	4822 051 20223	22k	5%	0,1W
3696	4822 051 20223	22k	5%	0.1W
3697	4822 051 20223	22k	5%	0.1W
3699	4822 051 20392	3k9	5%	0.1W
3702	4822 051 20471	470R	5%	0.1W
3703	4822 051 20471	470R	5%	0.1W
3704	4822 051 20154	150k	5%	0.1W
3705	4822 051 20154	150k	5%	0.1W
3706	4822 051 20479	47R	5%	0 1W
3707	4822 051 20479	47R	5%	0.1W
3709	4822 051 20103	10k	5%	0.1W
3711	4822 051 20562	5k6	5%	0.1W
3720	4822 051 20008	CHIP JUMPER 08C5		
3721	4822 051 20008	CHIP JUMPER 0805		
3740	4822 051 20562	5k6	5%	0.1W
3741	4822 051 20562	5k6	5%	0.1W
3742	4822 051 20223	22k	5%	0.1W
3743	4822 051 20223	22k	5%	0,1W
3744	4822 051 20273	27k	5%	0.1W
3745	4822 051 20104	100k	5%	0.1W
3746	4822 051 10102	1k	2%	0.25W
3747	4822 051 10102	1k	2%	0,25W
3760	4822 051 20109	10R	5%	0,1W
3761	4822 051 20109	10R	5%	0,1W
3764	4822 051 20339	33R	5%	0,1W
3765	4822 051 20682	6k8	5%	0,1W
3766	4822 051 20159	15R	5%	0,1W
3767	4822 051 20223	22k	5%	0,1W
3768	4822 051 10102	1k	2%	0,25W
3769	4822 117 10833	10k	1%	0,1W
3770	4822 051 20392	3k9	5%	0,1W
3771	4822 051 20221	220R	5%	0,1W
3772	4822 117 10833	10k	1%	0.1W
3786	4822 051 10102	1k	2%	0,25W
3787	4822 051 10102	1k	2%	0,25W
3789	4822 051 20104	100k	5%	0,1W
3790	4822 051 20104	100k	5%	0,1W
3795	4822 051 20183	18k	5%	0,1W
3805	4822 051 10102	1k	2%	0,25W
3806	4822 117 10833	10k	1%	0,1W
3807	4822 051 20103	10k	5%	0,1W
3808	4822 117 10833	10k	1%	0,1W
3809	4822 117 10833	10k	1%	0.1W
3810	4822 117 10833	10k	1%	0,1W
3811	4822 051 20472	4k7	5%	0,1W
3812	4822 051 20392	3k9	5%	0,1W
3813	4822 117 10833	10k	1%	0,1W
3814	4822 051 20105	1M	5%	0,1W
3816	4822 051 20223	22k	5%	0,1W
3817	4822 051 20223	22k	5%	0,1W
3818	4822 051 20223	22k	5%	0,1W
3819	4822 051 20223	22k	5%	0,1W
3820	4822 051 20223	22k	5%	0.1W
3827	4822 117 10834	47k	1%	0,1W
3828	4822 117 10833	10k	1%	0,1W
3829	4822 051 10102	1k	2%	0.25W
3830	4822 051 10102	1k	2%	0.25W
3831	4822 051 10102	1k	2%	0,25W
3832	4822 051 20008	CHIP JUMPER 0805		
3833	4822 117 10833	10k	1%	0,1W

CHIP RESISTORS

3836	4822 051 10102	1k	2%	0,25W
3842	4822 051 20223	22k	5%	0,1W
3844	4822 051 20223	22k	5%	0,1W
3857	4822 117 10833	10k	1%	0,1W
3858	4822 051 20474	470k	5%	0,1W
3859	4822 117 10833	10k	1%	0,1W
3866	4822 051 20103	10k	5%	0,1W
3867	4822 051 20103	10k	5%	0,1W

CAPACITORS

2650	4822 124 40248	10µF	20%	63V
2651	4822 124 40248	10µF	20%	63V
2652	4822 124 40242	1µF	20%	63V
2653	4822 124 40242	1µF	20%	63V
2660	4822 124 40244	2.2µF	20%	63V
2661	4822 124 40244	2.2µF	20%	63V
2668	5322 121 42498	680nF	5%	63V
2669	5322 121 42498	680nF	5%	63V
2672	4822 124 41551	100µF	20%	25V
2673	4822 124 41525	100µF	20%	25V
2682	4822 124 40242	1µF	20%	63V
2683	4822 124 40242	1µF	20%	63V
2688	4822 124 41525	100µF	20%	25V
2690	4822 124 40248	10µF	20%	63V
2692	4822 124 40242	1µF	20%	63V
2693	4822 124 40242	1µF	20%	63V
2708	4822 124 41525	100µF	20%	25V
2709	4822 124 41525	100µF	20%	25V
2714	4822 124 40248	10µF	20%	63V
2715	4822 124 40248	10µF	20%	63V
2716	4822 124 41525	100µF	20%	25V
2717	4822 124 22263	220µF	20%	25V
2718	4822 124 40248	10µF	20%	63V
2738	4822 124 40242	1µF	20%	63V
2739	4822 124 40242	1µF	20%	63V
2740	4822 124 40246	4,7µF	20%	63V
2741	4822 124 40246	4,7µF	20%	63V
2742	4822 124 40242	1µF	20%	63V
2743	4822 124 40242	1µF	20%	63V
2746	4822 121 51252	470nF	5%	63V
2747	4822 121 51252	470nF	5%	63V
2748	4822 124 40248	10µF	20%	63V
2749	4822 124 40248	10µF	20%	63V
2750	4822 124 40433	47µF	20%	25V
2751	4822 124 40242	1µF	20%	63V
2755	4822 124 41525	100µF	20%	25V
2756	4822 124 40246	4.7µF	20%	63V
2757	4822 124 22263	220µF	20%	25V
2762	5322 121 42975	15nF	5%	250V
2763	4822 124 40239	0,47µF	20%	63V
2766	4822 124 40246	4,7µF	20%	63V
2768	4822 124 41525	100µF	20%	25V
2797	4822 124 40242	1µF	20%	63V
2799	4822 124 41584	100µF	20%	10V
2800	4822 124 41525	100µF	20%	25V
2808	4822 124 40244	2,2µF	20%	63V

ELECTRICAL PARTSLIST ETF3 ANALOG RECORDER BOARD

CHIP CAPACITORS

2654	4822 122 33891	3,3nF	10%	63V
2655	4822 122 33891	3,3nF	10%	63V
2656	5322 122 32452	47pF	5%	50V
2656	5322 122 34099	470pF	10%	63V
2657	5322 122 32452	47pF	5%	50V
2657	5322 122 34099	470pF	10%	63V
2658	5322 122 32452	47pF	5%	50V
2659	5322 122 32452	47pF	5%	50V
2662	5322 122 34099	470pF	10%	63V
2674	4822 122 33496	100nF	10%	63V
2675	4822 122 33496	100nF	10%	63V
2684	5322 122 32452	47pF	5%	50V
2685	5322 122 32452	47pF	5%	50V
2686	5322 122 32659	33pF	5%	50V
2687	5322 122 32659	33pF	5%	50V
2702	4822 122 33173	560pF	10%	63V
2703	4822 122 33173	560pF	10%	63V
2706	5322 122 34099	470pF	10%	63V
2707	5322 122 34099	470pF	10%	63V
2710	4822 122 33128	15nF	10%	63V
2711	4822 122 33128	15nF	10%	63V
2712	5322 122 34123	1nF	10%	50V
2713	5322 122 34123	1nF	10%	50V
2730	4822 122 33515	82pF	5%	50V
2731	4822 122 33515	82pF	5%	50V
2732	4822 122 33806	820pF	10%	63V
2733	4822 122 33806	820pF	10%	63V
2734	5322 122 32654	22nF	10%	63V
2735	5322 122 32654	22nF	10%	63V
2736	4822 122 33177	10nF	20%	50V
2737	4822 122 33177	10nF	20%	50V
2744	5322 122 34123	1nF	10%	50V
2745	5322 122 34123	1nF	10%	50V
2752	5322 126 10223	4,7nF	10%	63V
2753	5322 126 10223	4,7nF	10%	63V
2754	5322 126 10223	4,7nF	10%	63V
2760	5322 122 32659	33pF	5%	50V
2761	5322 122 32659	33pF	5%	50V
2764	5322 126 10223	4,7nF	10%	63V
2765	4822 122 33177	10nF	20%	50V
2791	5322 122 34123	1nF	10%	50V
2792	5322 122 32531	100pF	5%	50V
2793	5322 122 32531	100pF	5%	50V
2794	5322 122 32531	100pF	5%	50V
2795	5322 122 32531	100pF	5%	50V
2796	5322 122 32654	22nF	10%	63V
2782	4822 122 33342	33nF	10%	63V
2787	4822 122 33342	33nF	10%	63V

ELECTRICAL PARTSLIST CD BOARD

MISCELLANEOUS

1810	4822 276 13503	SWITCH

DIODES

6857	4822 130 30621	1N4148
6881	4822 130 31981	BZX79-C3V9
6883	4822 130 31981	BZX79-C3V9

TRANSISTORS

7820	4822 130 41344	BC337-40
7856	5322 130 60123	BC807-40 (CHIP)
7872	5322 130 42136	BC848C(CHIP)
7881	5322 130 41983	BC858B(CHIP)
7883	4822 130 44197	BC558B
7884	4822 130 41344	BC337-40
7885	4822 130 41344	BC337-40

INTEGRATED CIRCUITS

7800	5322 209 11517	PC74HCU04T
7850	4822 209 31064	TDA1301T/N1
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7855	4822 209 31519	TDA7072A
7860	4822 209 33339	SAA7345GP/M5
7871	4822 209 32196	TDA1311AT/N2
7886	5322 209 86518	MC7805CT
7001	4822 209 80891	MC7805CT
7890	4822 209 33337	MC68HC05C8FB

COILS

5860	4822 242 81151	X-TAL 16,934MHz
5890	4822 242 72527	CERAMIC RES. 4.0 MHz

RESISTORS

3760	4822 116 52296	6k8	5%	0,5W
3761	4822 116 52283	4k7	5%	0,5W
3801	4822 116 52224	470R	5%	0,5W
3815	4822 050 11002	1k	5%	0,2W
3818	4822 116 83864	10k	5%	0,5W
3820	4822 050 11002	1k	5%	0,2W
3825	4822 116 83864	10k	5%	0,5W
3826	4822 116 83864	10k	5%	0,5W
3827	4822 116 83864	10k	5%	0,5W
3828	4822 116 83864	10k	5%	0,5W
3829	4822 116 83864	10k	5%	0,5W
3830	4822 116 83864	10k	5%	0,5W
3832	4822 116 52175	100R	5%	0,5W
3833	4822 116 83864	10k	5%	0,5W
3835	4822 116 52264	27k	5%	0,5W
3836	4822 116 52207	1k2	5%	0,5W
3837	4822 116 52296	6k8	5%	0,5W
3838	4822 116 52257	22k	5%	0,5W
3839	4822 116 52207	1k2	5%	0,5W
3840	4822 116 52296	6k8	5%	0,5W
3841	4822 116 52297	68k	5%	0,5W
3843	4822 116 83882	39k	5%	0,5W
3844	4822 050 11002	1k	5%	0,2W
3845	4822 116 83882	39k	5%	0,5W
3846	4822 050 11002	1k	5%	0,2W
3847	4822 116 40227	PTC		12V4R6

RESISTORS

3848	4822 050 11002	1k	5%	0,2W
3849	4822 052 10338	3R3		NFR25
3850	4822 050 11002	1k	5%	0,2W
3851	4822 116 52264	27k	5%	0,5W
3852	4822 050 11002	1k	5%	0,2W
3853	4822 116 52296	6k8	5%	0,5W
3857	4822 116 52215	220R	5%	0,16W
3858	4822 116 52215	220R	5%	0.16W
3860	4822 116 52175	100R	5%	0,5W
3871	4822 116 52186	22R	5%	0,5W
3876	4822 116 52284	47k	5%	0,5W
3877	4822 116 52284	47k	5%	0,5W
3880	4822 050 11002	1k	5%	0,2W
3881	4822 050 11002	1k	5%	0,2W
3886	4822 116 52226	560R	5%	0,5W
3889	4822 116 83864	10k	5%	0,5W
3891	4822 116 52186	22R	5%	0,5W

CHIP RESISTORS

3750	4822 051 20154	150k	5%	0,1W
3751	4822 051 20331	330R	5%	0,1W
3752	4822 051 20221	220R	5%	0,1W
3754	4822 051 20105	1M	5%	0,1W
3755	4822 051 20103	10k	5%	0,1W
3762	4822 051 20221	220R	5%	0,1W
3763	4822 051 20221	220R	5%	0,1W
3764	4822 051 20221	220R	5%	0,1W
3785	4822 051 20103	10k	5%	0,1W
3790	4822 051 20103	10k	5%	0,1W
3791	4822 051 20103	10k	5%	0,1W
3792	4822 051 20103	10k	5%	0,1W
3793	4822 051 20103	10k	5%	0,1W
3795	4822 051 20103	10k	5%	0,1W
3802	4822 051 10102	1k	2%	0,25W
3803	4822 051 20335	3M3	5%	0,1W
3804	4822 051 20682	6k8	5%	0,1W
3805	4822 051 20223	22k	5%	0,1W
3806	4822 051 20103	10k	5%	0,1W
3807	4822 051 20103	10k	5%	0,1W
3808	4822 051 20473	47k	5%	0,1W
3809	4822 051 20332	3k3	5%	0,1W
3810	4822 051 20332	3k3	5%	0,1W
3811	4822 051 20223	22k	5%	0,1W
3812	4822 051 20332	3k3	5%	0,1W
3813	4822 051 20332	3k3	5%	0,1W
3814	4822 051 20332	3k3	5%	0,1W
3821	4822 051 20124	120k	5%	0,1W
3822	4822 051 20563	56k	5%	0,1W
3823	4822 051 20331	330R	5%	0,1W
3824	4822 051 20124	120k	5%	0,1W
3831	4822 051 20223	22k	5%	0,1W
3834	4822 051 20229	22R	5%	0,1W
3842	4822 051 20182	1k8	5%	0,1W
3854	4822 051 20103	10k	5%	0,1W
3855	4822 051 20224	220k	5%	0,1W
3856	4822 051 20223	22k	5%	0,1W
3862	4822 051 20105	1M	5%	0,1W
3863	4822 051 10102	1k	2%	0,25W
3864	4822 051 10102	1k	2%	0,25W

ELECTRICAL PARTSLIST CD BOARD

CHIP RESISTORS

3865	4822 051 10102	1k	2%	0,25W
3866	4822 051 20331	330R	5%	0,1W
3867	4822 051 20472	4k7	5%	0.1W
3885	4822 051 20222	2k2	5%	0,1W
3887	4822 051 20473	47k	5%	0.1W
3890	4822 051 10102	1k	2%	0,25W
3892	4822 051 20103	10k	5%	0,1W
3893	4822 051 20103	10k	5%	0,1W
3894	4822 051 20103	10k	5%	0.1W
3895	4822 051 20103	10k	5%	0.1W
3896	4822 051 20103	10k	5%	0,1W
3899	4822 051 20103	10k	5%	0,1W
4801	4822 051 10008	CHIP JUMPER 1206		
4802	4822 051 10008	CHIP JUMPER 1206		
4805	4822 051 10008	CHIP JUMPER 1206		
4806	4822 051 10008	CHIP JUMPER 1206		
4807	4822 051 10008	CHIP JUMPER 1206		
4808	4822 051 10008	CHIP JUMPER 1206		
4809	4822 051 10008	CHIP JUMPER 1206		
4810	4822 051 10008	CHIP JUMPER 1206		
4811	4822 051 10008	CHIP JUMPER 1206		
4812	4822 051 10008	CHIP JUMPER 1206		
4813	4822 051 10008	CHIP JUMPER 1206		
4814	4822 051 10008	CHIP JUMPER 1206		
4815	4822 051 10008	CHIP JUMPER 1206		
4816	4822 051 10008	CHIP JUMPER 1206		
4820	4822 051 10008	CHIP JUMPER 1206		
4850	4822 051 10008	CHIP JUMPER 1206		
4851	4822 051 10008	CHIP JUMPER 1206		
4853	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2769	4822 124 23401	4,7µF	20%	25V
2770	4822 124 23401	4,7µF	20%	25V
2814	4822 126 12339	2,2nF	10%	16V
2818	4822 124 80483	47µF	20%	6,3V
2831	4822 124 80483	47µF	20%	6,3V
2833	4822 124 80483	47µF	20%	6,3V
2836	4822 126 13098	5,6nF	20%	16V
2837	4822 122 10459	560pF	10%	50V
2839	4822 121 51387	10nF	20%	16V
2840	4822 122 10576	1,8nF	10%	16V
2843	5322 124 41948	0,47uF	20%	50V
2847	4822 124 80934	33µF	20%	25V
2848	4822 124 80483	47µF	20%	6,3V
2849	4822 124 40433	47µF	20%	25V
2850	4822 124 23401	4,7µF	20%	25V
2851	4822 121 51387	10nF	20%	16V
2853	5322 121 42386	100nF	5%	63V
2856	5322 121 42661	330nF	5%	63V
2860	4822 124 80483	47µF	20%	6,3V
2864	4822 124 42433	330µF	20%	6,3V
2866	4822 124 42433	330µF	20%	6,3V
2892	4822 124 11423	4,7uF	20%	

CHIP CAPACITORS

2752	5322 122 32531	100pF	5%	50V
2753	5322 122 32531	100pF	5%	50V
2762	5322 122 32658	22pF	5%	50V
2763	5322 122 32658	22pF	5%	50V
2764	5322 122 32658	22pF	5%	50V

CHIP CAPACITORS

2802	4822 122 33064	330nF	20%	25V
2803	4822 122 33515	82pF	5%	50V
2804	4822 122 33515	82pF	5%	50V
2805	5322 122 33538	150pF	5%	63V
2806	5322 122 31946	27pF	5%	50V
2807	5322 122 32452	47pF	5%	50V
2808	5322 122 32452	47pF	5%	50V
2809	5322 122 32452	47pF	5%	50V
2810	5322 122 32481	15pF	5%	50V
2811	5322 122 33538	150pF	5%	63V
2820	5322 116 80853	560pF	5%	63V
2821	4822 126 10326	180pF	5%	
2822	5322 122 31863	330pF	5%	50V
2823	5322 122 31865	1,5nF	10%	63V
2824	4822 126 10326	180pF	5%	
2825	4822 122 33575	220pF	5%	50V
2826	4822 122 33575	220pF	5%	50V
2827	4822 122 33575	220pF	5%	50V
2828	4822 122 33575	220pF	5%	50V
2829	4822 122 33575	220pF	5%	50V
2830	4822 122 33575	220pF	5%	50V
2834	5322 122 32654	22nF	10%	63V
2838	4822 122 33496	100nF	10%	63V
2852	4822 122 33496	100nF	10%	63V
2854	5322 122 32531	100pF	5%	50V
2857	5322 122 32452	47pF	5%	50V
2858	5322 122 32654	22nF	10%	63V
2859	4822 122 33496	100nF	10%	63V
2861	5322 122 32658	22pF	5%	50V
2862	5322 122 32661	56pF	5%	50V
2867	4822 122 33496	100nF	10%	63V
2876	5322 122 34123	1nF	10%	50V
2877	5322 122 34123	1nF	10%	50V
2878	5322 122 32531	100pF	5%	50V
2879	5322 122 32531	100pF	5%	50V
2881	4822 122 33496	100nF	10%	63V
2883	4822 122 33064	330nF	20%	25V
2891	4822 122 33496	100nF	10%	63V
2893	5322 122 32531	100pF	5%	50V
2894	5322 122 32531	100pF	5%	50V
2895	5322 122 32531	100pF	5%	50V
2897	5322 122 32838	82nF	10%	63V